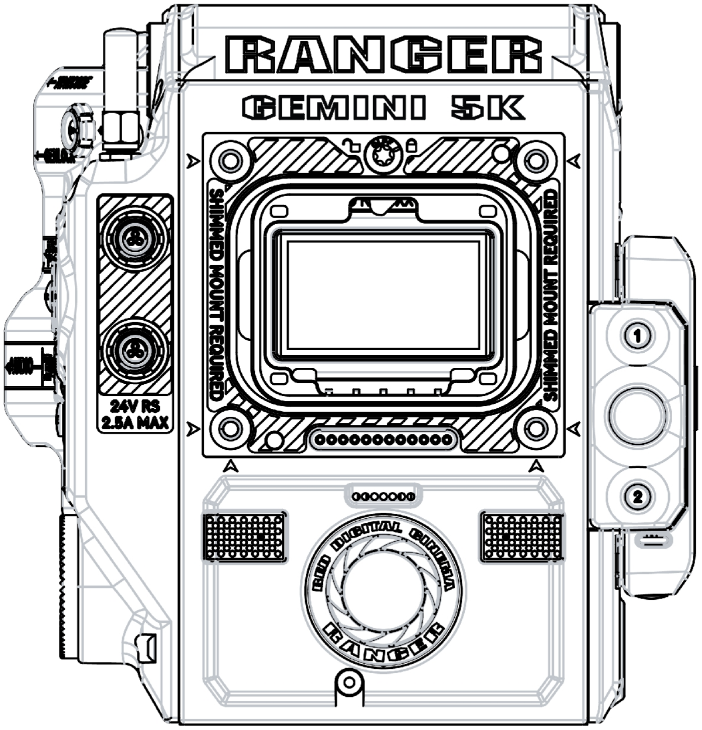
RED RANGER GEMINI

OPERATION GUIDE


RANGER
GEMINI 5K
SHIMMED MOUNT REQUIRED
SHIMMED MOUNT REQUIRED
24V RS
2.5A MAX
1
2
RED DIGITAL CINEMA
RANGER

GEMINI 5K S35 | V7.3

RED.COM

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TRANSLATION DISCLAIMER

This document was originally prepared in English, and any translations are provided for convenience only. While reasonable efforts were made to provide accurate translations, RED will not be held responsible for any errors, omissions, or ambiguities.

COMPLIANCE STATEMENTS

INDUSTRIAL CANADA EMISSION COMPLIANCE STATEMENTS

This device complies with Industry Canada license-exempt RSS standards RSS 139 and RSS 210. Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device. This Class A digital apparatus complies with Canadian ICES-003.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement. Cet appareil numérique de la classe [A] est conforme à la norme NMB-003 du Canada.

CAN ICES-3 (A)/NMB-3(A)

FEDERAL COMMUNICATIONS COMMISSION (FCC) STATEMENTS

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

In order to maintain compliance with FCC regulations, shielded cables must be used with this equipment. Operation with non- approved equipment or unshielded cables is likely to result in interference to radio and TV reception. The user is cautioned that changes and modifications made to the equipment without the approval of manufacturer could void the users authority to operate this equipment.

CAUTION: Exposure to Radio Frequency Radiation. The device shall be used in such a manner that the potential for human contact is minimized. This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 cm between the radiator and your body.

CAUTION: If the device is changed or modified without permission from RED, the user may void his or her authority to operate the equipment.

NOTE: This device complies with Part 15 of the FCC Rules. Operations subjected to the following two conditions (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including that may cause undesirable interference.

AUSTRALIA AND NEW ZEALAND STATEMENTS

RED declares that the radio equipment described in this document comply with the following international standards.

- IEC 62368-1 – Product Safety
- ETSI EN 300 328 – Technical requirement for radio equipment

RED declares digital devices described in this document comply with the following Australian and New Zealand standards.

- AS/NZS CISPR 32 Electromagnetic Compatibility
- AS/NZS 61000.3.2 -Harmonic Current Emissions
- AS/NZS 61000.3.3 -Voltage Changes, Voltage Fluctuations and Flicker

JAPAN STATEMENTS

This is a Class A product based on the standard of the Voluntary Control Council for Interference (VCCI). If this equipment is used in a domestic environment, radio interference may occur, in which case the user may be required to take corrective actions.

この装置は、クラス A 情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。 VCCI–A

GITEKI CERTIFICATION

This equipment contains specified radio equipment that has been certified to the Technical Regulation Conformity Certification under the Radio Law.

本機器は、電波法に基づく技術基準適合証明等を受けた特定無線デバイスを使用しております。

Ⓡ005-101325

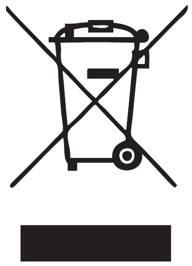
EUROPEAN UNION COMPLIANCE STATEMENTS

RED declares that the radio equipment described in this document comply with the EMC Directive (2014/30/EU) and the Low Voltage Directive (2014/35/EU) issued by the Commission of the European Community.

Compliance with this directive implies conformity to the following European Norms (in brackets are the equivalent international standards).

- EN 62368-1 (IEC 62368-1) – Product Safety
- ETSI EN 300 328 Technical requirement for radio equipment
- ETSI EN 301 489 General EMC requirements for radio equipment
- EN 55032 (CISPR 32) Electromagnetic Compatibility
- EN 55024 (CISPR 24) Immunity Characteristics
- EN 61000-3-2 (IEC 61000-3-2) Harmonic Current Emissions
- EN 61000-3-3 (IEC 61000-3-3) Voltage changes, voltage fluctuations and flicker

WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT (WEEE)



The Waste Electrical and Electronic Equipment (WEEE) mark applies only to countries within the European Union (EU) and Norway. This symbol on the product and accompanying documents means that used electrical and electronic products should not be mixed with general household waste. For proper treatment, recovery and recycling, please take this product to designated collection points where it will be accepted free of charge. Alternatively, in some countries you may be able to return your products to your local retailer upon purchase of an equivalent new product.

Disposing of this product correctly will help save valuable resources and prevent any potential negative effects on human health and the environment, which could otherwise arise from inappropriate waste handling. Please contact your local authority for further details of your nearest designated collection point. Penalties may be applicable for incorrect disposal of this waste, in accordance with you national legislation.

For business users in the European Union, if you wish to discard electrical and electronic equipment, please contact your dealer or supplier for further information.

RESPONSIBLE PARTY

RED Digital Cinema
34 Parker
Irvine, CA 92618
USA

SAFETY INSTRUCTIONS

- DO NOT use the camera or accessories near water. Avoid exposing your camera to moisture. The unit is not waterproof, so contact with water could cause permanent damage to the unit as well as electric shock and serious injury to the user. DO NOT use the camera in the rain or under other conditions with high moisture without appropriate protection, and immediately remove power source if camera or accessories are exposed to moisture.

WARNING: To reduce the risk of fire or electric shock, do not expose the camera to rain or moisture.

- DO NOT expose the camera to laser beams, as laser beams may damage the sensor.
- DO NOT expose your camera to excessive vibration or impact (shock). Be careful not to drop your camera. Internal mechanisms may be damaged by severe shock. Mechanical alignment of optical elements may be affected by excessive vibration.
- ELECTROMAGNETIC INTERFERENCE: The use of devices using radio or other communication waves may result in the malfunction or interference with the unit and/or with audio and video signals.
- Clean only using a dry cloth. When cleaning your camera, remember that it is not waterproof and moisture can damage electronic circuitry. DO NOT rinse or immerse any element of the camera, lens or other accessory, keep them dry at all times. DO NOT use soaps, detergents, ammonia, alkaline cleaners, and abrasive cleaning compounds or solvents. These substances may damage lens coatings and electronic circuitry.
- Maintain sufficient ventilation–DO NOT block any ventilation openings or obstruct cooling fan airflow.

CAUTION: Proper camera ventilation requires a minimum 0.5" (1.25 cm) clearance between the camera ventilation openings and external surfaces. Verify that objects that can block the fan intake and exhaust ports do not impede airflow. Failure to permit adequate airflow may result in overheating of the camera, degraded operation and in extreme situations, damage to the camera.

- DO NOT operate or store near any heat sources such as radiators, heat registers, stoves, or any other apparatus that produce heat. Store in a protected, level and ventilated place. Avoid exposure to temperature extremes, damp, severe vibration, strong magnetic fields, direct sunlight or local heat sources during storage. Remove any batteries from the camera before storage. Recommended storage and usage temperatures for your camera, lenses and other accessories are:
  - Operating range: 0°C to 40°C (32°F to 104°F)
  - Storage range: -20°C to 50°C (-4°F to 122°F)
- If there are any performance issues with your camera or accessories when operating within this temperature range, submit a Support ticket at https://support.red.com.
- Lens mounts are NOT HOT SWAPPABLE, meaning you cannot remove or install these items while the camera is turned on. Before installing or removing these items, you MUST turn off the camera. Failure to do so may result in damage to the item or camera that is not covered under warranty.
- DO NOT bypass the third prong of the grounding-type plug on the power cord of the included power adaptor. A grounding-type plug has two blades and a third “grounding” prong. The third prong is provided for your safety. A grounding-type plug shall be connected to an outlet with a protective earthen connection. If the grounding-type plug does not fit into your outlet, do not attempt to modify the plug or outlet, consult a qualified electrician.
- Protect all power cords from being pinched, walked on or driven over by a vehicle. Replace any power cords suspected of sustaining damage due to crushing or other forms physical damage.

Products marked with this symbol are class 2 devices. These devices are not provided with a grounding type plug.

CAUTION: The power cord plug for the included power adaptor is used as the power disconnect. To disconnect all power from the power adaptor, unplug the power cord plug from the wall outlet. During use, the power cord plug should remain easily accessible at all times.

- Lithium-ion batteries may be subject to special handling requirements pursuant to federal and local laws. Refer to specific shipping instructions included with your battery regarding proper transport of your battery. Do not handle your battery if it is damaged or leaking. Disposal of batteries must be in accordance with local environmental regulations. For example, California law requires that all rechargeable batteries must be recycled by an authorized recycle center. Storing batteries fully charged or in high temperature conditions may permanently reduce the life of the battery. Available battery capacity may also be temporarily lessened after storage in low temperature conditions.

WARNING: DO NOT expose the battery to excessive heat.

WARNING: Danger of explosion if an incorrect battery is charged with the RED Charger or is used to power the camera and accessories. Replace only with the same or equivalent type battery.

CAUTION: Refer all service and repair to qualified RED service personnel. To reduce the risk of electric shock, and damage to the camera or accessories, DO NOT attempt to perform any servicing other than any procedures that are recommended in the operating instructions.

INDOOR USE ONLY: This device is designed for use indoors only.

BATTERY STORAGE AND HANDLING

WARNING: Failure to read, understand, and follow these instructions may result in overheating, chemical leakage, smoke emission, fire, or other potentially harmful results.

- Always follow proper battery handling and storage practices. Improper handling and/or failure to abide by proper storage instructions may cause permanent damage to batteries, or degrade battery charge holding capacity. Improper handling practices or failure to comply with instructions may also put you at risk.
- Lithium-Ion batteries, like the REDVOLT®, REDVOLT-V, REDVOLT XL, and RED BRICK®, self-discharge over time. When storing for long periods of time, store batteries separately from the camera or charger and remember to charge batteries to a capacity level of 40% to 60%. If batteries will be stored for long periods of time, RED recommends that you check the charge level at least once every six (6) months, and recharge batteries to a capacity level of 40% to 60%.
- When not in use, remove the battery from the camera or charger and store the battery in a cool, dry place. Avoid extreme hot temperatures (such as inside a hot car), corrosive gas, and direct sunlight. The optimal storage temperature for batteries is between -20°C to 20°C (-4°F to 68°F).

WARNING: Batteries stored in a discharged state for long periods of time may self-discharge and lose the ability to hold a charge.

WARNING: If recharging operation fails to complete even when a specified recharging time has elapsed, immediately stop further recharging.

- DO NOT store batteries in a fully charged state for extended DO NOT store batteries in a fully charged state for extended periods of time.
- DO NOT store batteries in a fully discharged state for extended periods of time.
- DO NOT store batteries in the camera or in a charger for extended periods of time.
- DO NOT use batteries for purposes other than their intended use.
- DO NOT store batteries in extreme hot or cold temperatures.
- DO NOT store batteries in direct sunlight.
- DO NOT use third-party chargers with your RED batteries.
- DO NOT disassemble or modify the battery.
- DO NOT overcharge batteries. Overcharging may increase internal temperature beyond the recommended limits and cause permanent damage to the battery.
- DO NOT connect the positive (+) and negative (-) terminals to a metal object such as a wire.
- DO NOT transport or store the battery together with metal objects such as jewelry, hairpins, etc. as they may generate heat if they come into contact with the battery.
- DO NOT discard the battery into fire or heat.
- DO NOT store, use, or recharge the battery near a heat source such as a fire or a heater.
- DO NOT allow the battery to get wet.
- DO NOT pierce the battery with pointed or other sharp objects.
- DO NOT step on, throw, or strike the battery with a hammer.
- DO NOT use a battery that appears to be deformed or damaged.
- DO NOT directly solder the battery.
- DO NOT put the battery into a microwave oven or a pressurized container.
- DO NOT use or subject the battery to intense sunlight or hot temperatures such as in a car in hot weather.
- DO NOT use it in a location where static electricity may be present.
- DO NOT exceed the recharging temperature range of 0˚C to 40˚C (32˚F to 104˚F).
- RED recommends that you only use RED chargers to recharge RED batteries.
- Store the battery in a location where children cannot reach it.
- If the battery leaks or gives off a bad odor, discontinue use immediately.
- If the battery gives off an odor, generates heat, becomes discolored or deformed, or in any way appears abnormal during use, recharging or storage, immediately remove it from the equipment or battery charger and discontinue use.
- If electrolyte begins leaking from the battery and comes into contact with your skin or clothing, immediately wash it away with running water. Failure to do this may result in skin inflammation.
- If the battery leaks and the electrolyte reaches the eyes, do not rub them. Instead, rinse the eyes with clean running water and immediately seek medical attention. Failure to do this may result in eye injury.
- If you find discoloration, a bad odor due to leakage, overheating and/or other irregularities when using the battery for the first time, submit a Support ticket at https://support.red.com.

NOTE: For more information regarding RED battery charging and instructions for care, refer to our Terms and Conditions.

SHIPPING DISCLAIMER

Shipment of Lithium Ion cells and batteries is subject to national and international shipping requirements. A Class 9 Certified shipper is required to transport these products within the United States. REDVOLT, REDVOLT-V, REDVOLT XL, and RED BRICK batteries are considered Dangerous Goods. Other products such as REDVOLT AA and RED Li 7.2V batteries may also be classified as Dangerous Goods when purchased in bulk. Applicable laws prohibit the shipping of batteries that are physically damaged. We urge you to look into the formal rules and regulations of shipping Class 9 Dangerous Goods prior to preparing your shipment. For more information on these regulations, visit www.iata.org and www.dot.gov.

For more information, see our FAQs for Dangerous Goods (Regulated Items).

CHAPTER 1:

PRODUCT INTRODUCTION

RANGER
GEMINI 5K
GENLOCK
AUDIO
24V RS
2.5A MAX
RED DIGITAL CINEMA PROFESSIONAL
1
2
RED DIGITAL CINEMA RANGER

Figure: RED RANGER GEMINI

RED RANGER GEMINI is an integrated 5K S35 camera system offering an all-in-one system for top-tier production use. It features all of the benefits of the GEMINI 5K S35 sensor within a compact and less complex platform for filmmakers. Features like integrated I/O's, 24V power out, shimmed PL Mount, and improved thermal performance offer unmatched versatility as well as peace of mind in challenging shooting environments.

RED RANGER GEMINI is capable of handling the rigorous strain and robust power needs of high-end studio productions. RED RANGER GEMINI supports wide input voltage (11.5V to 32V), offers independent SDI and AUX power outputs, and features an integrated XLR audio input. The camera also boasts a larger fan for quieter and more efficient temperature management. RED RANGER GEMINI is available in two configurations, supporting either V-Lock or Gold Mount batteries.

This section introduces the imaging capabilities and advanced features of the camera system.

This guide is for the following cameras only:

SENSOR TYPE	CAMERA
GEMINI 5K S35	RED RANGER GEMINI 5K S35 (V-Lock) RED RANGER GEMINI 5K S35 (Gold Mount)

ADDITIONAL RESOURCES

The following resources offer additional information about RED, the DSMC system, and the RED community:

- **RED.com**: Check the official RED website for the latest information about RED products.
- **RED Learn Articles**: RED offers in-depth technical articles about RED cameras, post-production, and digital cinematography.
- **RED Downloads**: Go to RED Downloads to download the latest firmware, operation guides, and post-production software.
- **DSMC Toolkit**: Go to RED Downloads to find the DSMC Toolkit, which offers many helpful tools and resources to customize and improve your camera workflow.
- **RED Support**: Check the RED SUPPORT site for FAQs, or to file a support ticket.
- **In-Camera Help**: Select the Help button on an in-camera screen to open up the help for that screen.
- **REDUSER**: Discuss all things RED on the REDUSER third-party forum.

CHAPTER 2:

CAMERA SYSTEM COMPONENTS

NOTE: Lens mounts are NOT HOT SWAPPABLE, meaning you cannot remove or install these items while the camera is turned on. Before installing or removing these items, you MUST turn off the camera. Failure to do so may result in damage to the item or camera that is not covered under warranty.

NOTE: Availability of components listed in this chapter is subject to change at any time.

RED RANGER GEMINI CAMERA BODY

This section describes the controls, buttons, and features on the RED RANGER GEMINI camera body. For information on the input/output connectors, go to Input/Output Connectors.

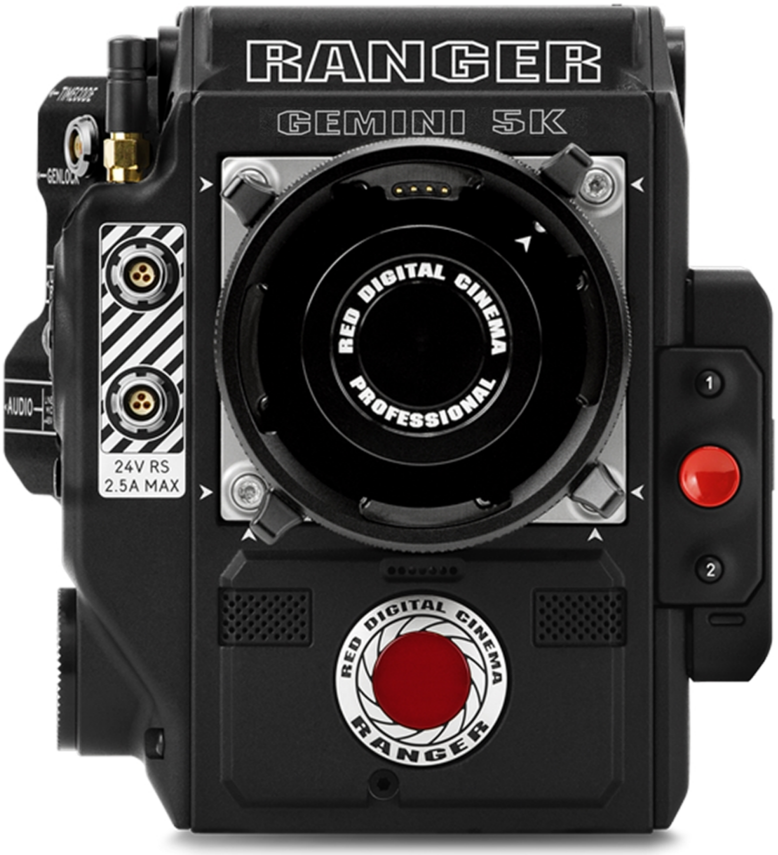

RANGER
GEMINI 5K
GENLOCK
AUDIO
24V RS
2.5A MAX
RED DIGITAL CINEMA PROFESSIONAL
1
2
RED DIGITAL CINEMA RANGER

Figure: Camera Body Controls and Features

CAMERA BODY CONTROLS AND FEATURES

CAMERA FRONT

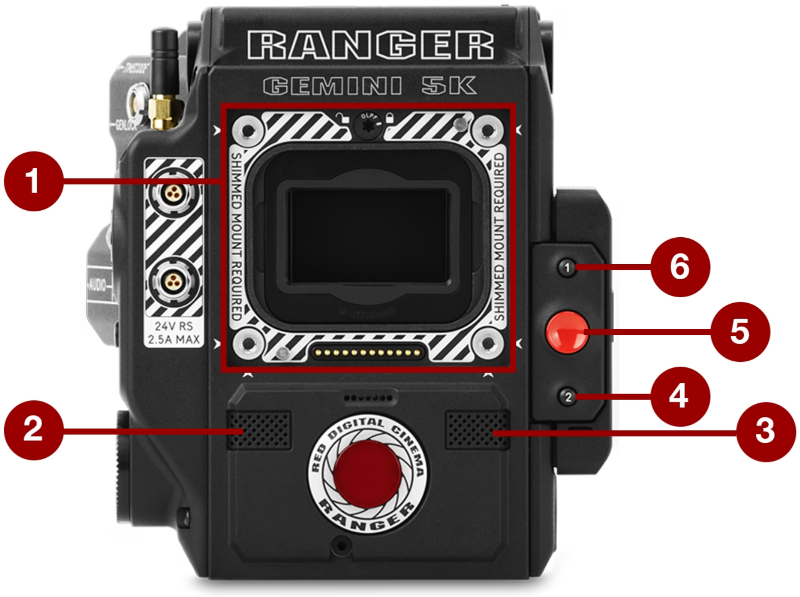


Figure: Camera Body Controls and Features

#	ITEM	DESCRIPTION
1	Lens mount area	Attach lens mount
2	Mic 1	Left audio channels: Ch1 and Ch3. Go to Record and Monitor Audio
3	Mic 2	Right audio channels: Ch2 and Ch4. Go to Record and Monitor Audio
4	User Key 2	Programmable key User Key 1 + 2 Press: Eject Media
5	REC Button	Programmable key Full Press: Record Toggle Half Press: AF Start
6	User Key 1	Programmable key User Key 1 + 2 Press: Eject Media

CAMERA TOP

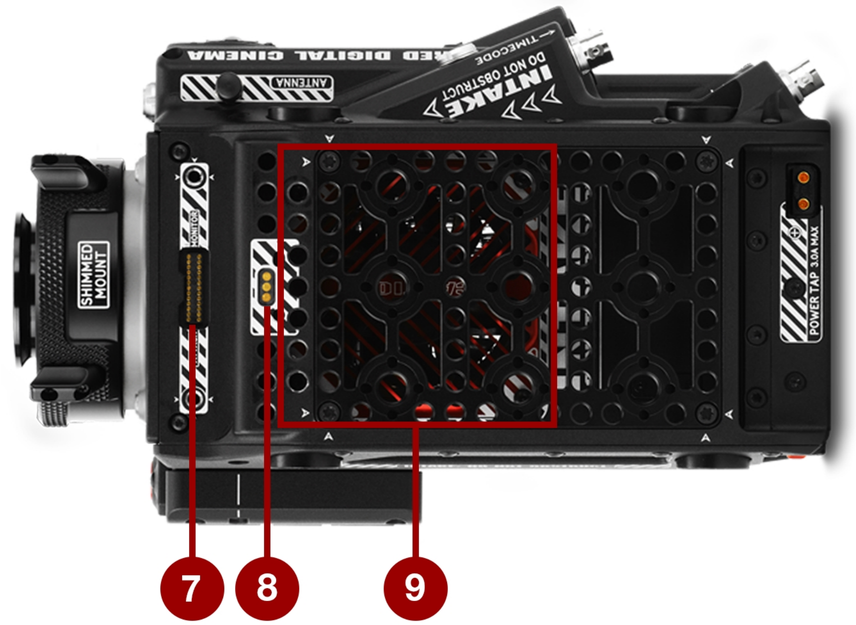

7
8
9
SHIMMED MOUNT
MONITOR
ANTENNA
RED DIGITAL CINEMA
TIMECODE
DO NOT OBSTRUCT
INTAKE
POWER TAP 3.0A MAX

Figure: Camera Body Controls and Features

#	ITEM	DESCRIPTION
7	Primary EVF/LCD Port	Mount a DSMC2 RED Touch LCD, LCD/EVF Adaptor A, or LCD/EVF Adaptor D
8	Top Handle Port	Mount the DSMC2 Top Handle or DSMC2 Outrigger Handle. This is the only mounting option for the DSMC2 Top Handle or DSMC2 Outrigger Handle (it cannot be attached backward)
9	Fan intake	DO NOT block fan intake when the camera is on

CAMERA LEFT

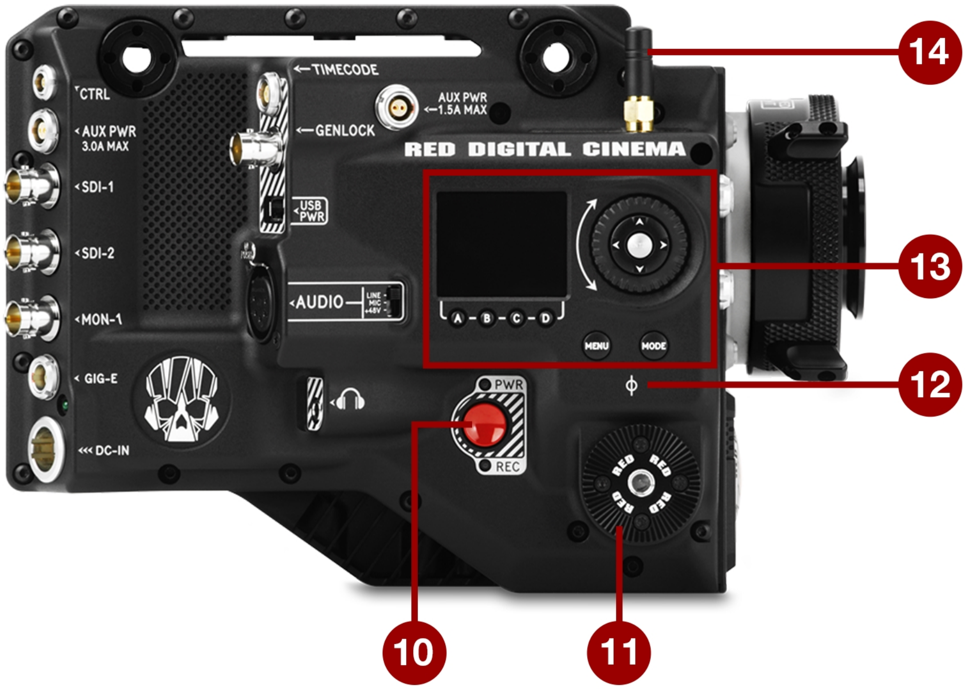

14
13
12
10
11
CTRL
AUX PWR 3.0A MAX
SDI-1
SDI-2
MON-1
GIG-E
DC-IN
TIMECODE
GENLOCK
AUX PWR 1.5A MAX
RED DIGITAL CINEMA
USB PWR
AUDIO
LINE MIC +48V
A B C D
MENU
MODE
PWR
REC

Figure: Camera Body Controls and Features

#	ITEM	DESCRIPTION
10	PWR/REC button	Fully press and hold the **PWR/REC** key for two (2) seconds to turn on/off. When the camera is on, fully press and then release the **PWR/REC** key to toggle record start/stop.
11	Industry-standard rosette	Features an M6 threaded hole in the center; use with cages or accessories that feature rosette-based mounting systems
12	Focal plane marks	Marks align with the sensor plane; pull focus from these marks.
13	Side LCD and Navigation	Go to Side LCD and Navigation
14	Wireless (802.11g) antenna	Uses standard female SMA connector; can be replaced with taller SMA connector antennas

CAMERA RIGHT

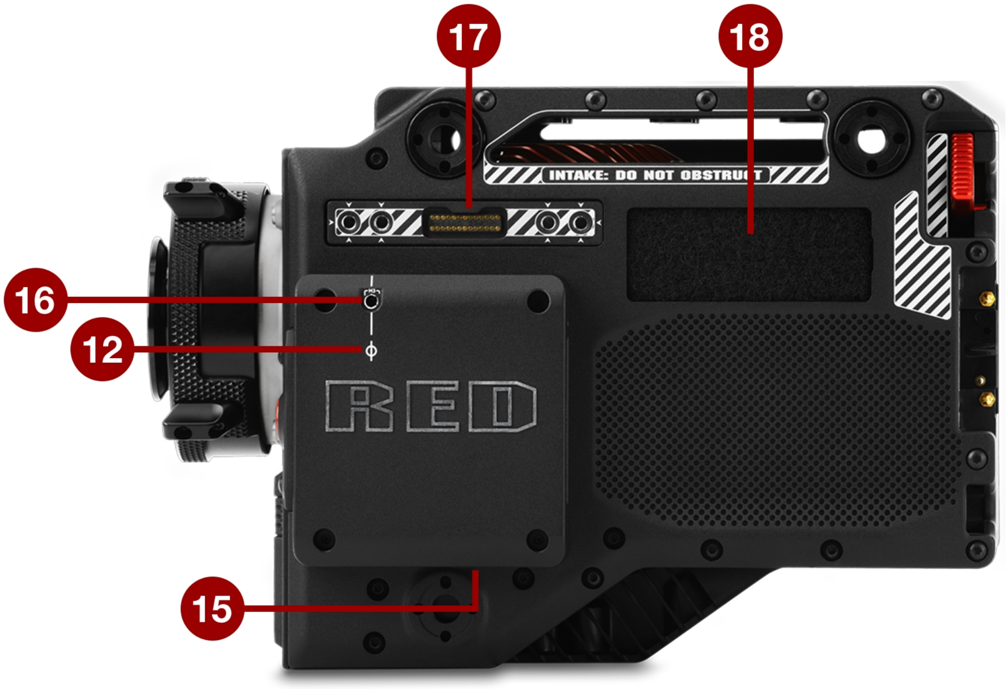


Figure: Camera Body Controls and Features

#	ITEM	DESCRIPTION
12	Focal plane marks	Marks align with the sensor plane; pull focus from these marks.
15	Focus Hook Screw Storage Location[1]	Store the focus hook screw
16	Focus Hook Mounting Point[1]	Mount the focus hook
17	Secondary EVF/LCD Port	Mount a DSMC2 RED Touch LCD or LCD/EVF Adaptor D. The secondary LCD/EVF port and a MON-1 port cannot be used at the same time. Go to Monitor Preferences
18	Hook and loop patch	Rectangle of hook and loop material for attaching labels

1. Install only the focus hook screw to this mounting point. Damage to the media bay or other components of the camera system caused by installing other devices is not covered under warranty.

CAMERA BACK

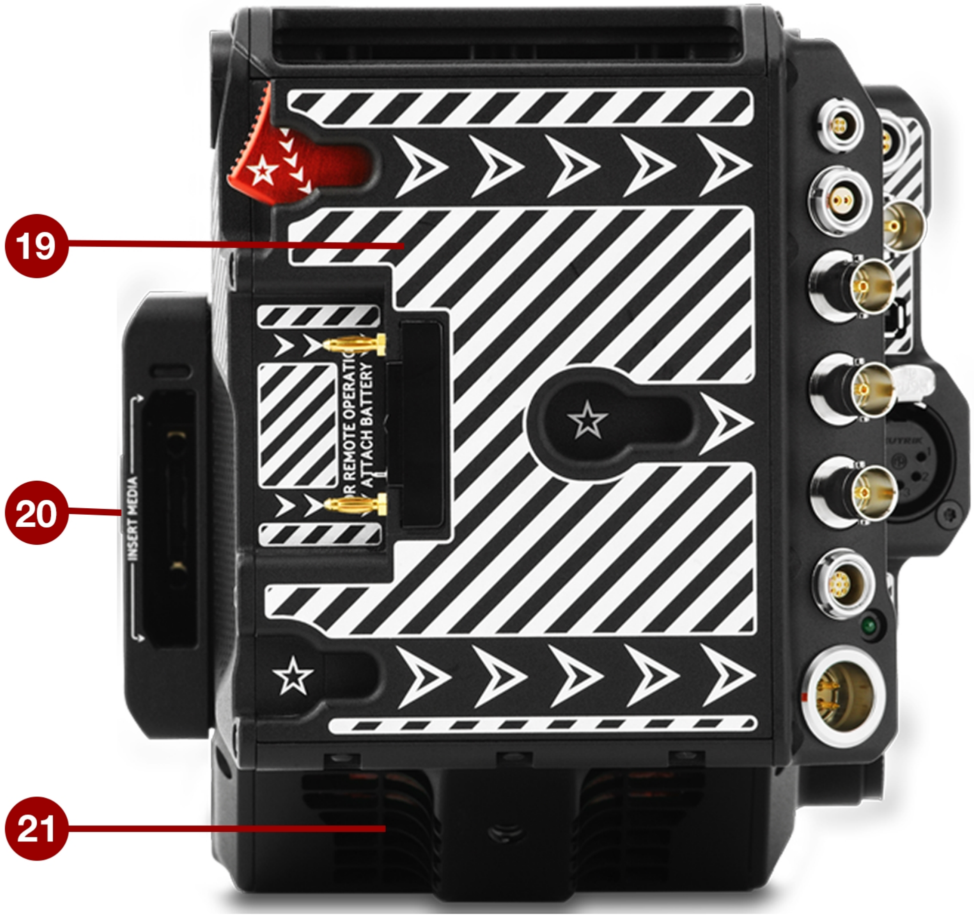

19
20
21
INSERT MEDIA
R REMOTE OPERATIO
ATTACH BATTERY

Figure: Camera Body Controls and Features (shown with gold mount)

#	ITEM	DESCRIPTION
19	Battery mount	Depending on the RED RANGER type, you can attach either a gold mount battery or a v-lock battery
20	Media mount	Mount RED MINI-MAG media
21	Fan exhaust	DO NOT block fan exhaust when the camera is on

CAMERA BOTTOM

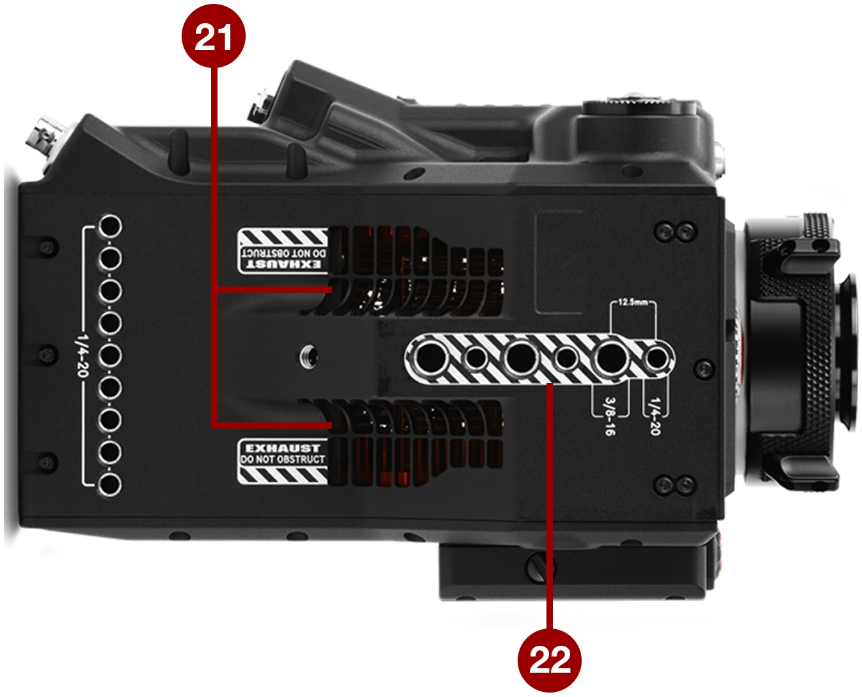

21
EXHAUST
DO NOT OBSTRUCT
1/4-20
12.5mm
3/8-16
1/4-20
EXHAUST
DO NOT OBSTRUCT
22

Figure: Camera Body Controls and Features

#	ITEM	LOCATION	DESCRIPTION
21	Fan exhaust	Back/Bottom	DO NOT block fan exhaust when the camera is on
22	Mounting Points	Bottom	Mount plates, tripods, monopods, etc.

CAMERA BODY LEDS

LEFT SIDE LEDS

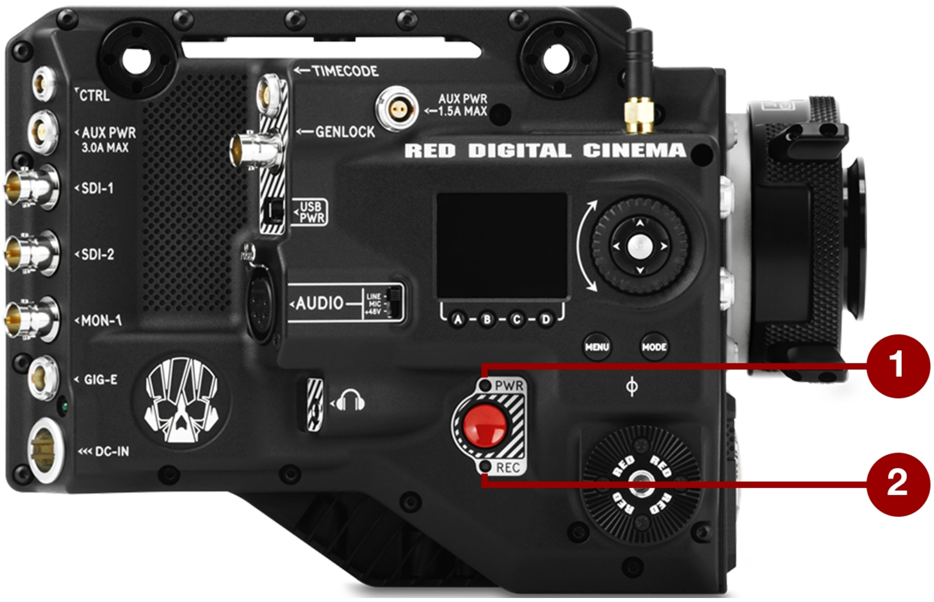

CTRL
AUX PWR 3.0A MAX
SDI-1
SDI-2
MON-1
GIG-E
DC-IN
TIMECODE
GENLOCK
AUX PWR 1.5A MAX
USB PWR
AUDIO
RED DIGITAL CINEMA
A - B - C - D
MENU
MODE
PWR
REC
1
2

Figure: RED RANGER LEDs, Left Side

LED	COLOR/FLASHING	DESCRIPTION
Power Status LED (PWR)	Off	Camera off
	Green	Camera on
	Amber flashing	Camera on; 5 to 10 min of battery time available
	Amber	Camera booting
	Red flashing	Camera on; < 5 min of battery time available
	Red	Camera shutting down
Record Status LED (REC)	Off	No media present
	Green	Ready to record
	Amber	Finalizing
	Red flashing (slow)	Media mounted; > 5% and ≤ 10% of media available
	Red flashing (fast)	Media mounted; ≤ 5% of media available
	Red	Recording
Power Status LED (PWR) and Record Status LED (REC)	Both green flashing	Firmware update in progress
	Both red flashing	Firmware update error

MEDIA BAY LED

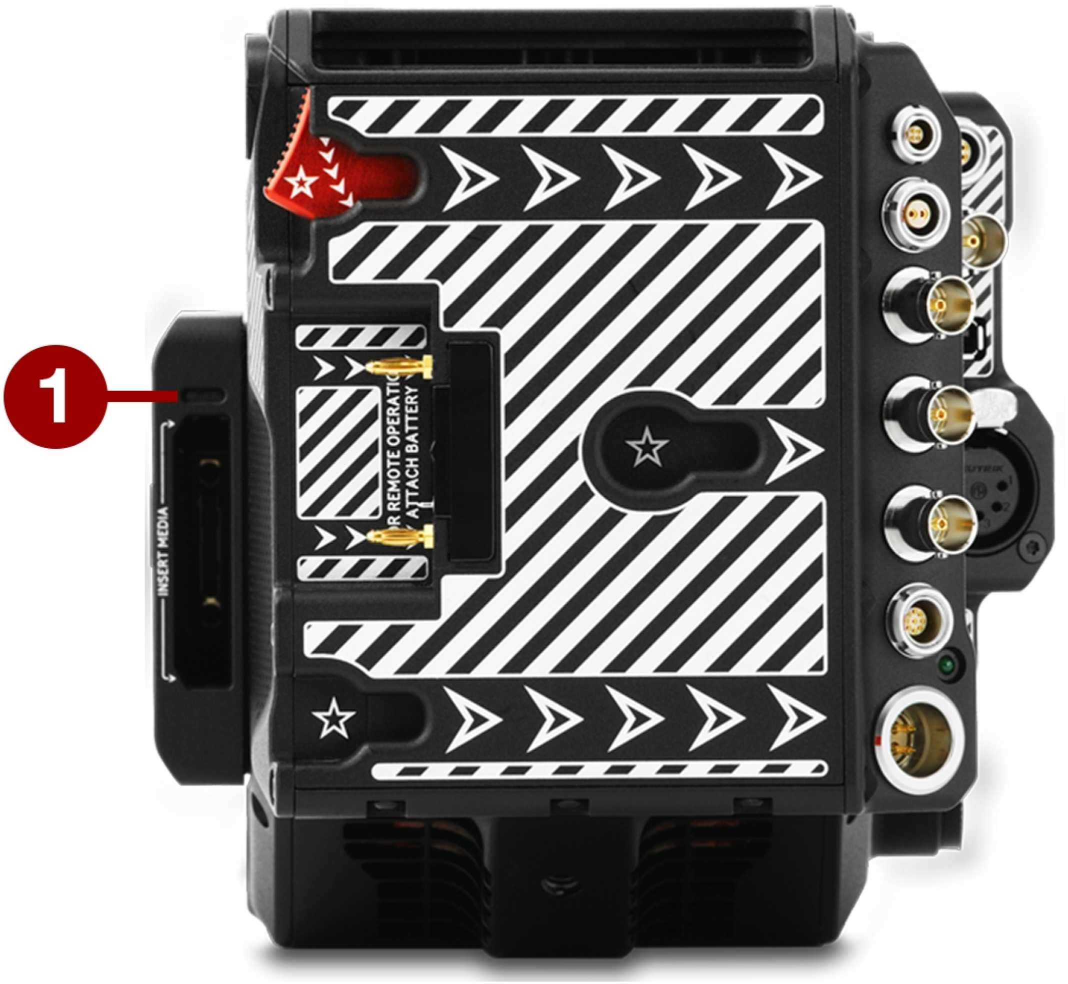


Figure: Media Bay LED

#	LED	COLOR/FLASHING	DESCRIPTION
1	Media Status LED (Back of media bay)	Off	No media mounted
		Green	Preview; media mounted; > 10% of media space available
		Amber	Record finalizing or playback mode
		Amber flashing (slow)	Formatting media
		Red flashing (slow)	Media mounted; > 5% and ≤ 10% of media available
		Red flashing (fast)	Media mounted; ≤ 5% of media available
		Red	Recording; media mounted; > 10% of media available

REC LED

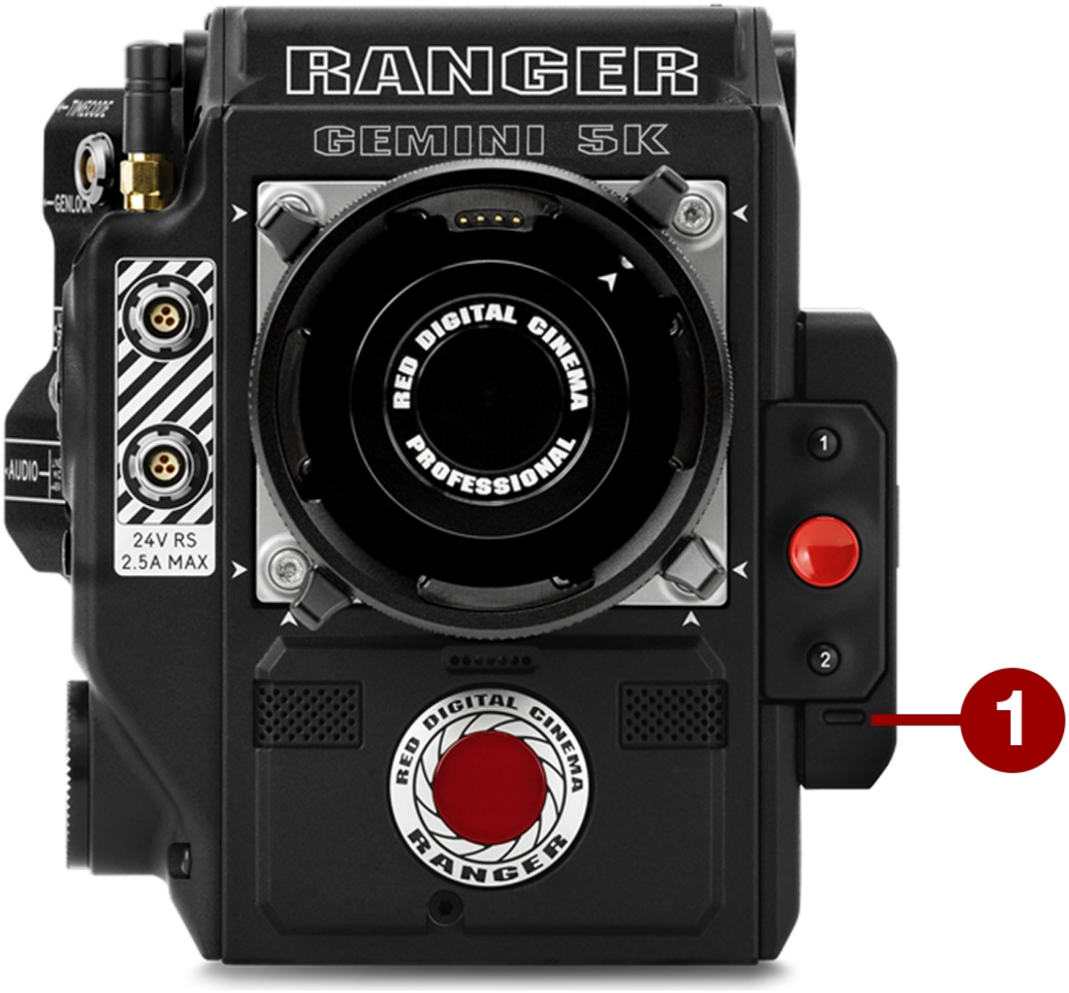


Figure: REC LED

#	LED	COLOR/FLASHING	DESCRIPTION
1	Record Status LED[1]	Off	Not recording, or media not mounted
		Red	Recording

1. For more information on how to enable/disable this LED, go to Indicator. If media is not mounted, this LED is off.

RED MINI-MAG SYSTEM

120GB RED MINI-MAG®
RED

Figure: RED MINI-MAG (120GB)

NOTE: For more information, see the DSMC Media Operation Guide, available at www.red.com/downloads.

RED MINI-MAG® SSDs deliver fast and reliable recording options for your camera. A RED STATION® enables you to connect media to your computer for offloading and editing.

RED offers the following RED MINI-MAG SSDs:

ITEM	PART NUMBER
RED MINI-MAG (120GB)	750-0075
RED MINI-MAG (240GB)	750-0082
RED MINI-MAG (480GB)	750-0090
RED MINI-MAG (512GB) V4[1]	750-0078
RED MINI-MAG (512GB) V5[1]	750-0078
RED MINI-MAG (512GB) V6[1]	750-0078
RED MINI-MAG (960GB)	750-0087
RED MINI-MAG (1TB)[2]	750-0081

1. To see the Model number, go to **Menu** > **Media** > **Device**.
2. The RED MINI-MAG 1TB can take up to 20 seconds to mount to a computer or a camera.

POWER COMPONENTS

The following RED batteries, battery chargers, and power cables are compatible with the RED RANGER:

ITEM	PART NUMBER	NOTES
REDVOLT-V	740-0043	For use with V-Lock
RED BRICK	740-0002	For use with V-Lock
RED RANGER AC Power Adaptor 270W	740-0048	Power adaptor for AC power; 3-pin female XLR
3-PIN XLR-TO-4-PIN 2B POWER CABLE (10')	790-0665	Connects the DC-IN port to the RED RANGER AC Power Adaptor or third-party 24/28V output power, such as Anton Bauer VCLX or Bebob Cube 1200 batteries

LCD/EVF ADAPTORS

The LCD/EVF adaptors enable you to use legacy RED displays (which feature LCD/EVF connectors) with the RED RANGER (which features pogo LCD/EVF connectors). For more information on available displays, go to Displays and Electronic Viewfinders.

ITEM	PART NUMBER
DSMC2 LCD/EVF Adaptor A	720-0037
DSMC2 LCD/EVF Adaptor B	720-0038
DSMC2 LCD/EVF Adaptor D	105-2119

LCD/EVF ADAPTOR A

LEMO ADAPTOR A

Figure: DSMC2 LCD/EVF Adaptor A

The DSMC2 LCD/EVF Adaptor A makes your existing RED Touch, RED PRO, and RED PRO Touch displays, as well as RED EVFs, fully compatible with the RED RANGER. The DSMC2 LCD/EVF Adaptor A converts the pogo connection on the RED RANGER to a 16-Pin 1B LCD/EVF port. The DSMC2 LCD/EVF Adaptor A is designed to attach to the primary (top) EVF/LCD port on the RED RANGER.

When used along with the DSMC2 LCD/EVF Adaptor B, this adaptor enables you to mount a DSMC2 RED Touch LCD away from the camera–to a NOGA arm or other stable mounting point.

The DSMC2 LCD/EVF Adaptor A is compatible with the BOMB EVF, (LCOS) and (OLED) models, or later.

LCD/EVF ADAPTOR B

RED DIGITAL CINEMA
LEMO ADAPTOR
1/4-20
1/4-20
1/4-20

Figure: DSMC2 LCD/EVF Adaptor B

The DSMC2 LCD/EVF Adaptor B converts the display signal from a pogo connection to a 16-Pin 1B LCD/EVF port.

When used along with the DSMC2 LCD/EVF Adaptor A or DSMC2 LCD/EVF Adaptor D, this adaptor enables you to mount a DSMC2 RED Touch LCD away from the camera–to a NOGA arm or other stable mounting point.

DSMC2 LCD/EVF ADAPTOR D

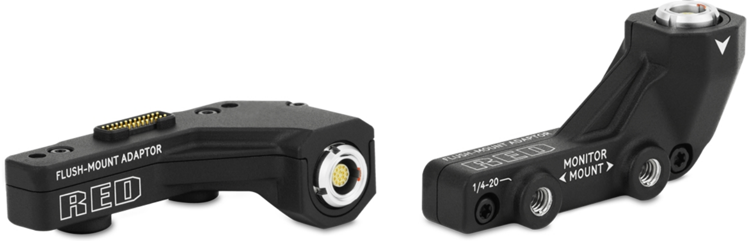


Figure: DSMC2 LCD/EVF Adaptor D

Similar to the DSMC2 LCD/EVF Adaptor A, the DSMC2 LCD/EVF Adaptor D converts the pogo connection on the RED RANGER to a 16-Pin 1B LCD/EVF port. The DSMC2 LCD/EVF Adaptor D is designed to attach to the primary (top), or the secondary (side) EVF/LCD port on the RED RANGER.

When used along with the DSMC2 LCD/EVF Adaptor B, this adaptor enables you to mount a DSMC2 RED Touch LCD away from the camera–to a NOGA arm or other stable mounting point.

The DSMC2 LCD/EVF Adaptor D is compatible with the BOMB EVF, (LCOS) and (OLED) models, or later.

CAMERA CONTROL DEVICES

This section describes the camera control devices that offer Record Start/Stop buttons:

ITEM	PART NUMBER
DSMC2 Top Handle	720-0035
DSMC2 Outrigger Handle	720-0044

DSMC2 TOP HANDLE

Figure: DSMC2 Top Handle

Ergonomic and intuitive, the DSMC2 Top Handle was engineered entirely around the most important action for any shooter–the record button. This intelligent top handle puts a new Record Start/Stop button at your fingertips, using built-in integrated circuitry.

The DSMC2 Top Handle mounts directly to the 1/4-20 mounting points on the top of the camera. With a rubberized grip and new trigger design–the DSMC2 Top Handle offers the ideal handle and shooting method for your camera.

DSMC2 OUTRIGGER HANDLE

Figure: DSMC2 Outrigger Handle

The DSMC2 Outrigger Handle offers a low profile side handle–designed with an ergonomic molded grip and integrated Record Start/Stop button. Mounted to the Top Handle Port on your camera, the DSMC2 Outrigger Handle provides comfort and stability, as well as additional 1/4-20 mounting points for your peripheral camera components. The built-in Record button puts Start/Stop functionality right at your fingertips–so you are always ready to capture the perfect shot.

The DSMC2 Outrigger Handle is ideal for shooters who use one hand on the handle, for grip and record button access, and the other for lens adjustments or support.

LENS MOUNTS

RED recommends only using the RED RANGER Shimmed PL Mount with the RED RANGER. Other RED lens mounts are mechanically compatible, but may cause focus accuracy issues.

ITEM	PART NUMBER
RED RANGER Shimmed PL Mount	725-0046

INTERCHANGEABLE OLPFS

The camera system includes intelligent, interchangeable optical low pass filters (OLPFs). The camera automatically recognizes the OLPF type installed, eliminating the need to configure OLPF settings in the camera menu.

RED offers the following modular DSMC2 S35 interchangeable OLPFs:

ITEM	PART NUMBER
DSMC2 S35 Standard OLPF	790-0513
DSMC2 S35 Skin Tone-Highlight OLPF	790-0511
DSMC2 S35 Low Light Optimized OLPF	790-0512
DSMC2 S35 H_2O OLPF	790-0547

RAILS, MOUNTS, TACTICAL GEAR, AND CABLES

RED offers a wide variety of support gear, mounting platforms, cables, accessories, and other equipment. For more information, visit the RED Store at www.red.com/store.

MAXIMUM SUPPORTED WEIGHTS

The table below lists the maximum weight each handle can support in specific configurations. Damage to handles or other components of the camera system caused by using a handle to lift more than the specified weight is not covered under warranty.

ITEM	PART #	CONFIGURATION	MAX WEIGHT
DSMC2 Universal Handle	790-0523	Attached directly to the camera body	30 lbs
Production Handle	105-2120	One riser attached to a plate; handle extension attached	40 lbs
		Two risers attached to a plate; handle extension attached	80 lbs

PRODUCTION HANDLE

RED
1/4-20
RED
1/4-20

Figure: Production Handle

The modular design of the Production Handle provides a configurable, rugged handle with an array of 1/4-20 and 3/8-16 mounting points for industry-standard accessories. It can be set up in a compact or extended configuration to suit various shooting needs.

The Production Handle ships with a focus hook, which can be mounted on the handle in two separate mounting points (one for DSMC2 cameras, and another for RED RANGER cameras).

CHAPTER 3:

BASIC OPERATIONS

POWER OPERATIONS

This section describes the basic power operations of the camera system.
(missing or bad snippet)

NOTE: Lens mounts are NOT HOT SWAPPABLE, meaning you cannot remove or install these items while the camera is turned on. Before installing or removing these items, you MUST turn off the camera. Failure to do so may result in damage to the item or camera that is not covered under warranty.

WARNING: While third-party batteries may be mechanically compatible with the camera system, the manufacturer is responsible for the performance and stability of third-party options, not RED®. Damage to the camera system or third-party devices caused by using third-party power options is not covered under warranty. The camera may be unable to determine and display the voltage or remaining battery capacity of third-party power options.

POWER PRIORITY

When multiple power sources are connected to the camera, power consumption is prioritized in this sequence:

1. Any power supply connected to the DC IN port
2. Rear battery

POWER CONSUMPTION

The camera draws approximately 4.2 A (63 W) when configured with the DSMC2 RED Touch 7.0" LCD and RED MINI-MAG® 512GB.

Under typical conditions batteries provide the following operating time:

- **REDVOLT-V**: Powers the camera and accessories for approximately 24 minutes.
- **RED BRICK**: Powers the camera and accessories for approximately 96 minutes.

POWER STATUS

The power status of the current primary power source displays in the Lower Status Row of the graphical user interface (GUI). Navigate to the Power In menu at **Menu** > **Power** > **Power In** for the status of all connected power sources. For more information, go to Power Menu.

APPROVED EXTERNAL DC POWER

The camera accepts input voltages of 11.5 V DC to 32 V DC, and can draw a maximum current of 14A. The camera can be powered continuously by connecting one (1) of the following to the DC IN port on the camera:

- **XLR DC power source**: Use the 3-PIN XLR-TO-4-PIN 2B POWER CABLE (10') to connect the DC-IN port to third-party 24/28V output power, such as Anton Bauer VCLX or Bebob Cube 1200 batteries

TURN ON THE CAMERA

NOTE: If you have just turned off the camera, wait at least three (3) seconds before turning the camera back on.

1. Attach a power source to the camera.
2. Press and release the **PWR/REC** key on the right side of the camera.

   The Power Status LED illuminates amber as the camera turns on.

   The Power Status LED illuminates green to confirm that the camera is turned on and ready to use.

TURN OFF THE CAMERA

Use one of the following methods to turn off the camera:

- Go to **Menu** > **Power** and select **Shutdown**.
- Press and hold **PWR/REC** until the **Shutting Down...** notification shows on the display.

NOTE: The camera turns off automatically if the supply voltage drops to 11.5 V.

CONFIGURE YOUR CAMERA

This section describes common options for configuring your camera system.
(missing or bad snippet)

DSMC2 TOP HANDLE AND DSMC2 OUTRIGGER HANDLE: INSTALL/REMOVE

INSTALL THE DSMC2 TOP HANDLE OR DSMC2 OUTRIGGER HANDLE

WARNING: Before installing or removing this item, you MUST turn off the camera.

REQUIRED TOOL(S): 3/16" hex key

1. Turn off the camera.
2. Position the DSMC2 Top Handle or DSMC2 Outrigger Handle on top of the camera, aligning the connector on the bottom of the handle with the connector on top of the camera.
3. Tighten the two (2) captive screws approximately two (2) turns each using a 3/16" hex key. DO NOT FULLY TIGHTEN.
4. Fully tighten the two (2) screws using a 3/16" hex key.

   WARNING: DO NOT OVERTIGHTEN.

REMOVE THE DSMC2 TOP HANDLE OR DSMC2 OUTRIGGER HANDLE

WARNING: Before installing or removing this item, you MUST turn off the camera.

REQUIRED TOOL(S): 3/16" hex key

1. Turn off the camera.
2. Loosen the two (2) captive screws using a 3/16" hex key.
3. Remove the DSMC2 Top Handle or DSMC2 Outrigger Handle from the camera.

INSTALL THE FOCUS HOOK SCREW

The camera comes with a screw stored in the bottom of the media bay, called the focus hook screw. You can install this screw in the Focus Hook Mounting point (along the sensor plane), and then pull focus from that location. You can either attach measuring tape directly to the screw, or you can install a hook to the screw, and attach the measuring tape to the hook.

To install the focus hook screw, follow the instructions below:

REQUIRED TOOL(S): Slotted screwdriver

1. Remove the focus hook screw from the Focus Hook Screw Storage Location on the media bay using a slotted screwdriver.

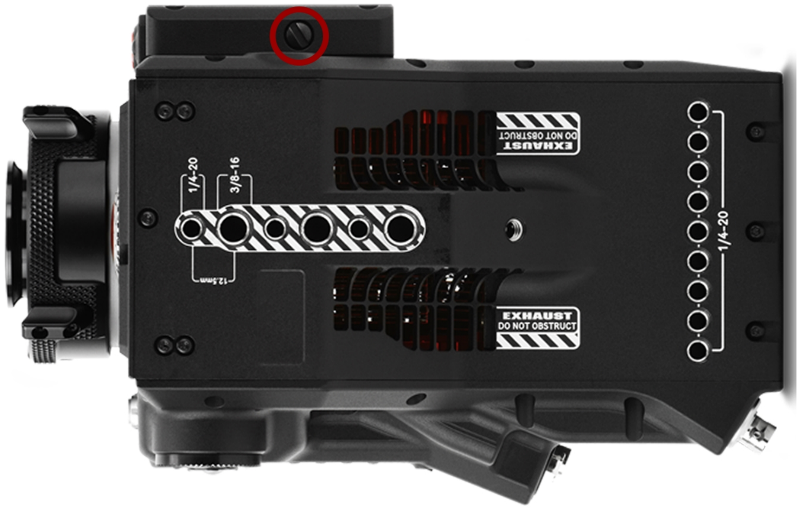


Figure: Focus Hook Screw Storage Location

2. Tighten the focus hook screw into the Focus Hook Mounting Point on the media bay using a slotted screwdriver.

   WARNING: DO NOT OVERTIGHTEN.

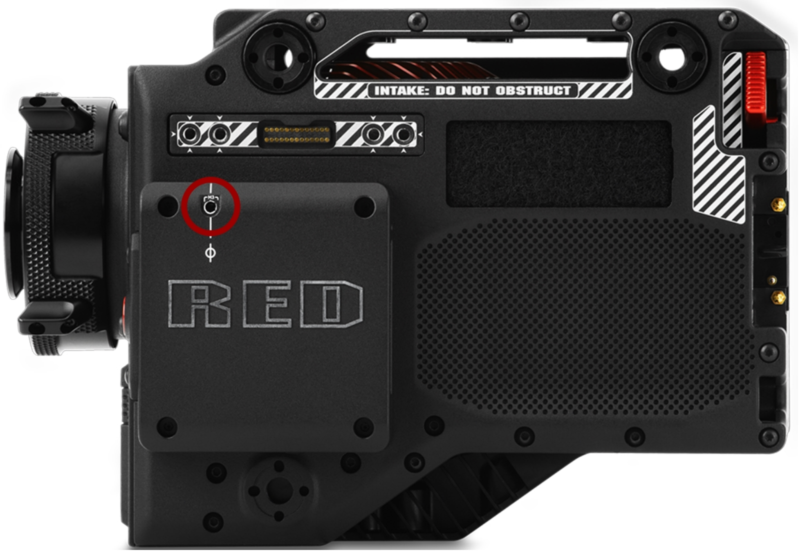


Figure: Focus Hook Mounting Point

SHIM THE RED RANGER SHIMMED PL MOUNT

The RED RANGER Shimmed PL Mount is shimmed in the factory to align to the RED RANGER it is packaged with. To shim a RED RANGER Shimmed PL Mount, use a DENZ® Flange Depth Controller (FDC), or similar tool, to measure the Flange Focal Distance (FFD).

The following shims are provided with each RED RANGER PL Mount Shim Pack:

SHIM SPECIFICATIONS

PART NUMBER	MICRONS	INCHES
125-4660-001	13	.0005
125-4660-002	19	.00075
125-4660-003	25	.0010
125-4660-004	50	.0020
125-4660-005	75	.0030

SHIM OFFSET STACK TABLE

The table below shows the offsets (as measured in microns) created by using different combinations of shims. Shimming requires no more than one (1) of each size shim and no more than three (3) total shims.

OFFSET WITHOUT SHIMS	SHIM 1	SHIM 2	SHIM 3	SHIM TOTAL	OFFSET AFTER SHIMS
50	50	–	–	50	0
55	50	–	–	50	5
60	50	13	–	63	-3
65	50	13	–	63	2
70	50	19	–	69	1
75	75	–	–	75	0
80	75	–	–	75	5
85	75	13	–	88	-3
90	75	13	–	88	2
95	75	19	–	94	1
100	75	25	–	100	0
105	75	25	–	100	5
110	75	25	13	113	-3
115	75	25	13	113	2
120	75	25	19	119	1
125	75	50	–	125	0
130	75	50	–	125	5
135	75	50	13	138	-3

OFFSET WITHOUT SHIMS	SHIM 1	SHIM 2	SHIM 3	SHIM TOTAL	OFFSET AFTER SHIMS
140	75	50	13	138	2
145	75	50	19	144	1
150	75	50	25	150	0

INSTALL SHIMS

REQUIRED TOOL(S): T6 TORX screwdriver, DENZ FDC (or similar tool), LOCTITE® 222

1. Turn off the camera.
2. Use a T6 TORX driver to remove the eight (8) screws on the lock ring assembly from the PL base.
3. Remove the lock ring assembly.
4. Add or remove the correct amount of provided shims measured with the DENZ FDC to the lock ring assembly. Add the thinnest shims first, and then add the thicker ones, so that the thicker shims hold the thinner shims in place.

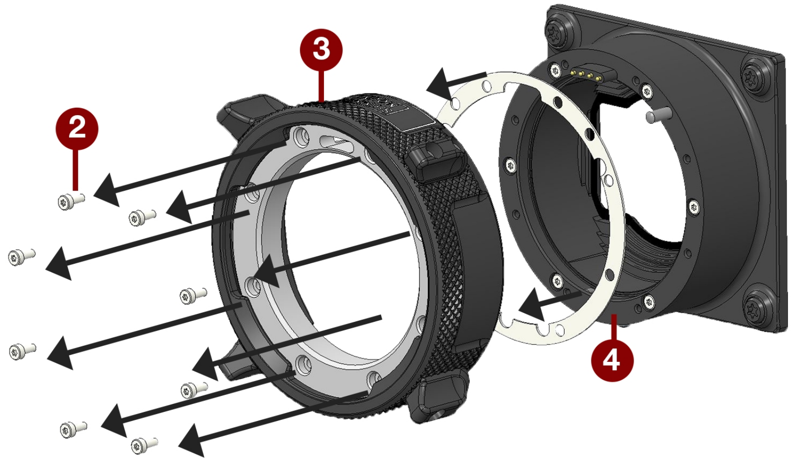


Figure: Shim Installation

5. Place the lock ring assembly back onto the PL base.
6. Place a small amount of LOCTITE 222 on each of the eight (8) leading threads.
7. Replace and loosely tighten the eight (8) M2x6 mm screws in a cross pattern ("X" pattern) using a T6 TORX driver.

   WARNING: DO NOT FULLY TIGHTEN
8. Tighten the eight (8) screws evenly in a cross pattern ("X" pattern) using a T6 TORX driver to 30 in-oz, or damage may occur.

   WARNING: DO NOT OVERTIGHTEN.

INTERCHANGEABLE OLPF SYSTEM

WARNING: Read these instructions carefully and in their entirety before removing or installing an OLPF. Damage to the OLPF module, camera, or sensor due to improper handling or use is not covered under warranty.

WARNING: Once an interchangeable OLPF is removed from the camera, the sensor is exposed. Improper handling of the OLPF modules or camera during this procedure may compromise the installation or cause irreparable damage to your camera or sensor.

WARNING: DO NOT allow any dirt or debris to enter the optical cavity.

WARNING: Use only DSMC2 S35 OLPFs. DO NOT use other OLPFs.

SWAP AN INTERCHANGEABLE OLPF

REQUIRED TOOL(S): T20 TORX driver

1. Turn off the camera.
2. Remove any cables or accessories that may interfere with operations.
3. Loosen and remove the four (4) M4x0.7 x 8 mm lens mount screws in a cross pattern (“X” pattern) using a T20 TORX driver.

   NOTE: Some lens mounts have captive screws that are not removable.

   NOTE: Screw removal may require a large handle T20 TORX driver and additional leverage.
4. Remove the lens mount.
5. Use a damp, lint-free cloth to gently wipe down the area around the lens mount and OLPF module. Remove as much dust and debris as possible.
6. Use a T20 TORX driver to turn the OLPF lock on the camera counter-clockwise by a third turn to the Unlock position. DO NOT turn the indicator mark past the Unlock icon.

   WARNING: DO NOT OVERTIGHTEN.
7. Remove the OLPF module and place it in its protective case.
8. Use an LED light to ensure that the optical cavity is clean and free from dust or debris.
9. Ensure the new OLPF module is clean and free of debris.
10. Install the new OLPF module straight into the optical cavity, keeping the front face of the OLPF module parallel to the front of the camera.

    NOTE: Inserting the OLPF module at an angle may cause it to not seat properly.
11. Use a T20 TORX driver to turn the OLPF lock on the camera clockwise by a third turn to the Lock position. DO NOT turn the indicator mark past the Lock icon.

    WARNING: DO NOT OVERTIGHTEN.

    NOTE: If the lock does not turn easily, gently press down on the OLPF module while turning the lock.
12. Replace the lens mount.
13. Replace and loosely tighten the four (4) M4x0.7 x 8 mm lens mount screws in a cross pattern (“X” pattern) using a T20 TORX driver. DO NOT FULLY TIGHTEN.

    NOTE: Some lens mounts have captive screws that are not removable.
14. Fully tighten the four (4) lens mount screws in a cross pattern (“X” pattern) using a T20 TORX driver. DO NOT exceed 350 in-oz, or damage may occur.

    WARNING: DO NOT OVERTIGHTEN.

USE A TRIPOD OR MONOPOD

This section describes the camera mounting points and mounting equipment for use with a tripod or monopod. The camera is equipped three (3) 3/8-16 mounting holes and three (3) 1/4-20 mounting holes on the bottom of the camera. These mounting points are designed for use with a variety of mounting plates and hardware, to support tripods and other support systems.

WARNING: Ensure that the tripod, monopod, or support system is designed and rated to handle the weight of your camera configuration. RED is not responsible for any damage caused by using a tripod, monopod, mount, or support system that does not provide sufficient support.

WARNING: DO NOT use excessive force to mount a support accessory, as this may damage the screw threading.

RED offers the following products for use with tripods and other support systems:

Item	Part Number
Mounting Plate (DSMC)	790-0094
DSMC Quick Release Platform Pack	790-0183
Quick Release Platform Pack (Bolt-On)	790-0078
Quick Release Platform (Dovetail)	790-0079
Quick Release Platform (Mini)	790-0390
Dovetail Mounting Plate (Long)	790-0083
Dovetail Mounting Plate (Short)	790-0084

For more information, visit the RED store at www.red.com/store.

VIDEO MONITOR OUTPUTS

The monitoring path converts RAW sensor data to a white balanced 12-bit depth 1920 x 1080 pixel RGB 4:4:4 video signal. The signal may be modified using ISO, White Balance, or other RGB color space adjustments. The signal is then scaled and gamma-corrected to provide monitor outputs at 10-bit depth in 4:2:2 YCC or 8-bit depth in 4:4:4 RGB.

The camera offers the following monitor outputs:

- **EVF/LCD**: Supports a RED EVF or LCD display.
- **HD-SDI**: Provides a 720p or 1080p output suitable for monitoring or recording to an external VTR or DDR device. It may be configured for 10-bit LIN (VIDEO) or 10-bit LOG (FILM) encoded data.

VIDEO MONITOR CATEGORIES

Video monitor outputs are separated into three (3) categories:

- **VIEWFINDER**: The Upper Status Row, Live Action Area, and Lower Status Row display. Default output is the EVF/LCD connector located on top of the camera. If an EVF or LCD is not connected, you can transfer the VIEWFINDER output to the SDI output.
- **PROGRAM/Clean**: None of the graphic overlays display.
- **PREVIEW**: The Live Action Area and associated graphic overlays display.

For more information about changing the video monitor category of your monitor, go to Monitor Mode.

RECORD

Perform one of the following actions to begin recording:

- Press **PWR/REC** on the camera.
- Press **START/STOP** on the DSMC2 Top Handle or DSMC2 Outrigger Handle.
- Trigger start/stop with a compatible third-party trigger.
- Double-tap the right 25% on an attached touchscreen display (when enabled).

NOTE: To enable Double-Tap Right 25% to Record, go Advanced.

RECORD VIA HD-SDI

NOTE: Audio is not embedded in the MON-1 signal.

This section describes how to record via HD-SDI through simultaneous record (recording to an SSD and an external recorder at the same time) or external record only.

SIMULTANEOUS RECORD

NOTE: The secondary LCD/EVF port and a MON-1 port cannot be used at the same time. Go to Monitor Preferences.

You can record simultaneously to an external recorder and a RED SSD. To record simultaneously, follow the instructions below:

1. Connect the camera to an external recorder with an HD-SDI cable.
2. Ensure that a formatted SSD is inserted in the camera.
3. Set up the HD-SDI output:
   A. Go to **Menu** > **Monitoring** > **Monitors** and select a monitor.
   B. Select **Clean** from the **Mode** drop-down menu (otherwise the external recorder records the overlay).
   C. Select the output resolution from the **Resolution** drop-down menu.
   NOTE: The HD-SDI maximum resolution is 1080p. For more information, go to Record/Monitor Out Ports.
4. Disable all False Colors (otherwise the external recorder records the False Colors). For more information, go to Tools.

5. If monitoring audio via a third-party monitor that supports audio, set up the monitor mix:
   A. Go to **Menu** > **Settings** > **Audio** > **Mix** > **Monitor Mix**.
   B. Adjust the input channels.
6. Go to **Menu** > **Settings** > **Recording** > **Mode**.
7. Select **Local** from the **Storage** drop-down menu.
8. Begin recording.

EXTERNAL RECORD

NOTE: The secondary LCD/EVF port and a MON-1 port cannot be used at the same time. Go to Monitor Preferences.

You can record to an external recorder without recording to an SSD. To record to an external device only, follow the instructions below:

1. Connect the camera to an external recorder with an HD-SDI cable.
2. Ensure the SSD is ejected.
3. Set up the HD-SDI output:
    A. Go to **Menu** > **Monitoring** > **Monitors** and select a monitor.
    B. Select **Clean** from the **Mode** drop-down menu (otherwise the external recorder records the overlay).
    C. Select the output resolution from the **Resolution** drop-down menu.

    NOTE: The HD-SDI maximum resolution is 1080p. For more information, go to Record/Monitor Out Ports.
4. Disable all False Colors (otherwise the external recorder records the False Colors). For more information, go to Tools.

5. If monitoring audio via a third-party monitor that supports audio, set up the monitor mix:
    A. Go to **Menu** > **Settings** > **Audio** > **Mix** > **Monitor Mix**.
    B. Adjust the input channels.
6. Go to **Menu** > **Settings** > **Recording** > **Mode**.
7. Select **External** from the **Storage** drop-down menu.
8. Begin recording.

CHAPTER 4:

BASIC MENUS AND CONTROLS

(missing or bad snippet)

GUI MENU INTRODUCTION

This section describes the structure and layout of the graphical user interface (GUI) that overlays the video monitor signal. Advanced GUI menu controls enable convenient access to menus, overlays, and other critical camera information. Functionality varies based on monitor output type and firmware version. The GUI menu is organized in the following way:

By three (3) sections:

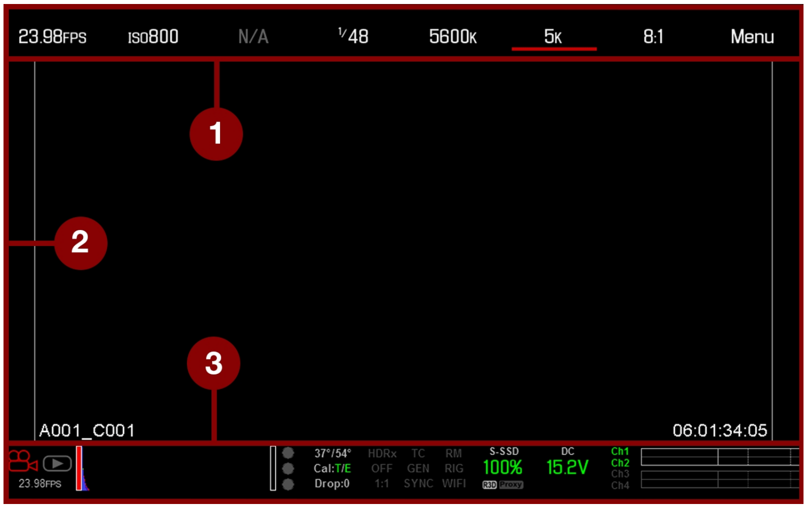

23.98FPS
ISO800
N/A
1/48
5600K
5K
8:1
Menu
1
2
3
A001_C001
06:01:34:05
23.98FPS
37°/54°
Cal:T/E
Drop:0
HDRx
OFF
1:1
TC
GEN
SYNC
RM
RIG
WIFI
S-SSD
100%
R3D Proxy
DC
15.2V
Ch1
Ch2
Ch3
Ch4

Figure: GUI Control Menu

#	ITEM	DESCRIPTION
1	Upper Status Row (Basic Menu)	Easy access to primary camera capture parameters. Go to "Upper Status Row (Basic Menu)" on the next page.
2	Live Action Area	Live camera recording view, overlays, guides, and more. Go to "Live Action Area" on page 42.
3	Lower Status Row	Critical camera parameters, record/playback modes, media and power status, and audio meter. Go to "Lower Status Row" on page 43.

UPPER STATUS ROW (BASIC MENU)

The Upper Status Row displays basic project parameters. The currently selected parameter in the Upper Status Row is underlined with a red bar. The Upper Status Row is also known as the Basic Menu.

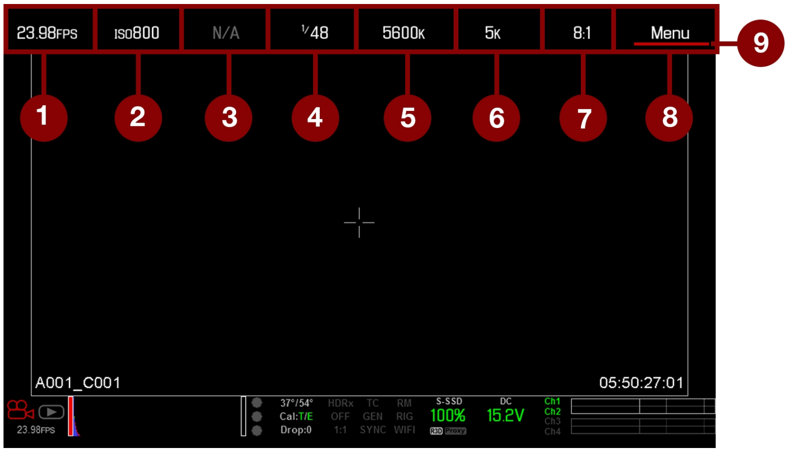

23.98FPS
ISO800
N/A
1/48
5600K
5K
8:1
Menu
9
1
2
3
4
5
6
7
8
A001_C001
05:50:27:01
23.98FPS
37°/54°
Cal:T/E
Drop:0
HDRx
OFF
1:1
TC
GEN
SYNC
RM
RIG
WIFI
S-SSD
100%
R3D
Proxy
DC
15.2V
Ch1
Ch2
Ch3
Ch4

Figure: Upper Status Row

The Upper Status Row includes the following GUI elements:

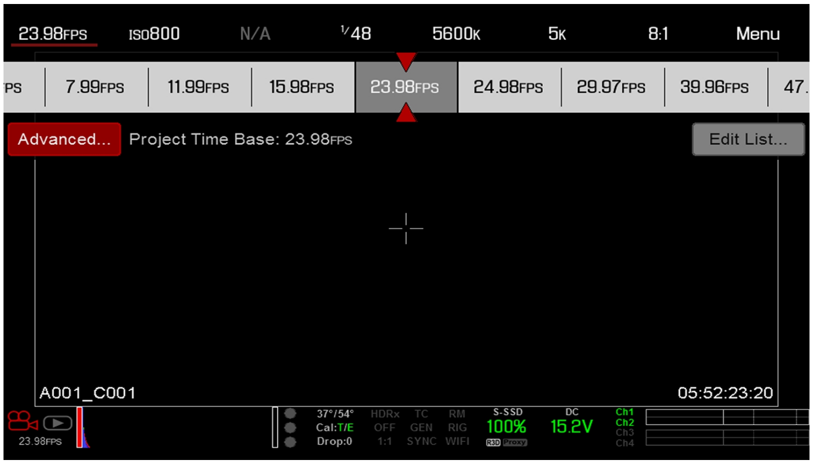
#	ITEM	DESCRIPTION	DETAILS
1	Frame Rate (fps)	Recording frame rate	Frame Rate
2	ISO	Camera sensitivity	ISO
3	Aperture	Lens aperture (F stop) information	"Aperture" on page 41
4	Exposure (Shutter)	Integration time or shutter angle	Exposure/Shutter
5	Color Temperature	White balance and Tint	Color Temperature
6	Resolution	Record resolution	Format
7	REDCODE®	REDCODE compression setting	"REDCODE" on page 41
8	Menu	Access advanced settings	Advanced Menus
9	Cursor	Indicates currently selected Upper Status Row element	N/A

ACCESS ADVANCED MENUS

For every Upper Status Row item, you can select the **Advanced...** button to access the related menu in the Advanced Menus.

For example, select **Advanced...** in the Frame Rate menu to open **Menu** > **Settings** > **Project** > **Frame Rate**.

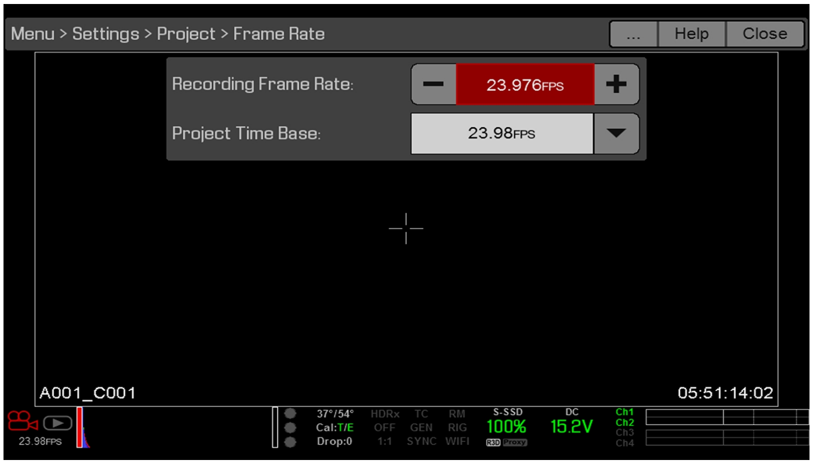
For more information about Advanced Menus, go Advanced Menus.



Project Time Base: 23.98FPS

23.98FPS
ISO800
N/A
1/48
5600K
5K
8:1
Menu
PS
7.99FPS
11.99FPS
15.98FPS
23.98FPS
24.98FPS
29.97FPS
39.96FPS
47.
Advanced...
Edit List...
A001_C001
05:52:23:20
23.98FPS
37°/54°
Cal:T/E
Drop:0
HDRx OFF 1:1
TC GEN SYNC
RM RIG WIFI
S-SSD 100%
DC 15.2V
Ch1
Ch2
Ch3
Ch4

Figure: Select "Advanced..." Button



Recording Frame Rate: 23.976FPS

Project Time Base: 23.98FPS

Menu > Settings > Project > Frame Rate
...
Help
Close
A001_C001
05:51:14:02
23.98FPS
37°/54°
Cal:T/E
Drop:0
HDRx OFF 1:1
TC GEN SYNC
RM RIG WIFI
S-SSD 100%
DC 15.2V
Ch1
Ch2
Ch3
Ch4

Figure: Advanced Menu

FEATURE: EDIT LIST

Select the **Edit List...** button in the Upper Status Row menus to change the values that display for each setting. For example, if you open the Frame Rate menu and select **Edit List...**, the camera lets you add or remove values.

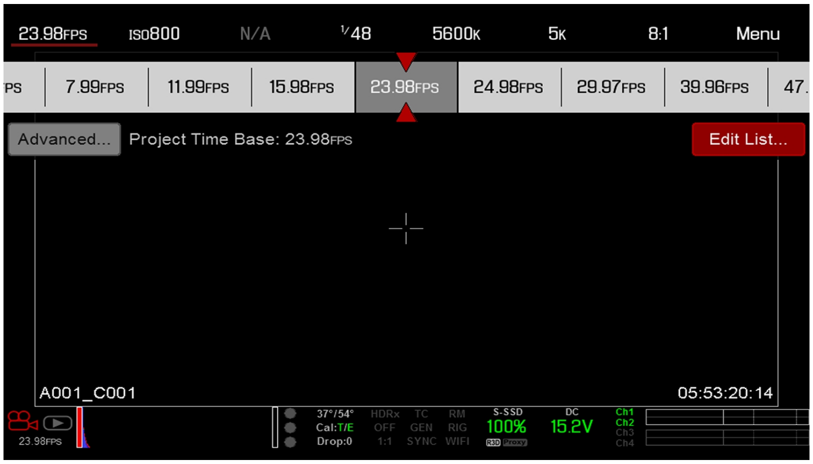


Figure: Select "Edit List..." Button

APERTURE

The aperture (also known as the T stop or F stop) parameter displays when a compatible mount and lens are installed. The aperture controls the depth of field of the image and, in combination with the shutter speed/angle setting, controls the amount of light that reaches the sensor (exposure).

- Increasing the aperture to a higher number increases the depth of field, but reduces the exposure (brightness).
- Decreasing the aperture to a lower number decreases the depth of field, but increases the exposure (brightness).

RED DSMC PL MOUNT INSTALLED

The current aperture of the attached lens displays when a DSMC® PL mount is installed and a supported lens equipped with Cooke® S4/i® system is attached.

Select the **Advanced...** button to access the **Menu** > **Settings** > **Setup** > **Lens** screen. For more information, go to Lens.

REDCODE

Select the target REDCODE compression ratio for your project.

If the camera is able to achieve the target compression ratio, the compression ratio displays in white. If the camera is unable to achieve the target compression ratio, the compression ratio displays in yellow, and the camera uses the next possible compression ratio.

The current compression ratio is automatically recalculated when changes are made to the project resolution, aspect ratio, anamorphic setting, frame rate, HDRX® mode, media, or the target REDCODE compression ratio.

The RECODE compression affects the overall quality of the footage. A lower compression (for example: 2:1) increases the quality of the footage, while a higher compression (for example: 22:1) lowers the quality.

REDCODE range is 2:1 to 22:1. Default is 8:1.

For maximum available REDCODE values, see the DSMC Media Operation Guide at www.red.com/downloads.

LIVE ACTION AREA

The Live Action Area contains the recorded image area, Look Around area, and various overlays. The color of each overlay can be customized to maximize the contrast between the guide(s) and scene being captured.

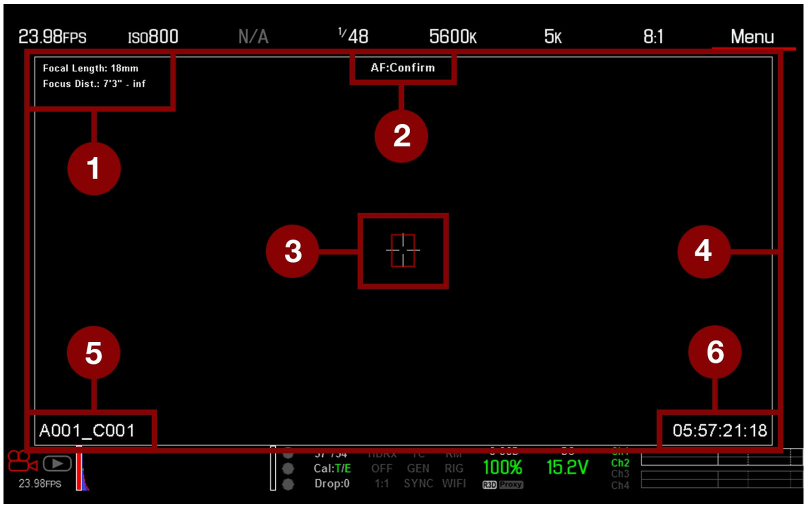

23.98FPS
ISO800
N/A
1/48
5600K
5K
8:1
Menu
Focal Length: 18mm
Focus Dist.: 7'3" - inf
AF:Confirm
1
2
3
4
5
6
A001_C001
05:57:21:18
23.98FPS
Cal:T/E
Drop:0
OFF
1:1
GEN
SYNC
RIG
WIFI
100%
15.2V
Ch2
Ch3
Ch4

Figure: Live Action Area

The Live Action Area includes the following GUI elements:

#	ITEM	DESCRIPTION	DETAILS
1	Lens Information	Lens information when using supported lenses	"Lens Information" below
2	AF Status	Currently selected auto focus mode	Focus Menu
3	Center Crosshair and Spot Focus Guide	Crosshair: Center of selected guide Reference guides: Safe Action/Safe Title, Picture Center, Grid Overlay	General Tab
4	Frame Guides	Record or sensor projection area	Guides
5	Clip Filename	Filename of the clip being recorded, or filename of the next clip to be recorded	N/A
6	Timecode Value	Current timecode value	Timecode

LENS INFORMATION

This section describes the lens information displays when a supported lens is attached.

PL LENSES

Displays the focal length and focal distance when a DSMC PL mount is installed and a lens with the Cooke S4/i system (or equivalent) is attached. For more information, go to Lens Tab.

LOWER STATUS ROW

The Lower Status Row provides access to key system information and camera values.

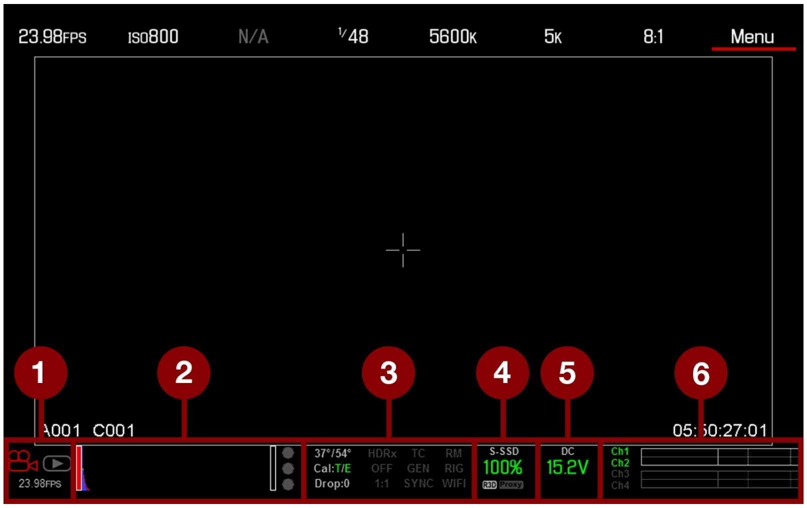

23.98FPS
ISO800
N/A
1/48
5600K
5K
8:1
Menu
1
2
3
4
5
6
A001 C001
05:50:27:01
23.98FPS
37°/54°
Cal:T/E
Drop:0
HDRx
OFF
1:1
TC
GEN
SYNC
RM
RIG
WIFI
S-SSD
100%
R3D
Proxy
DC
15.2V
Ch1
Ch2
Ch3
Ch4

Figure: Lower Status Row

#	ITEM	SUB-ITEM/DESCRIPTION	DETAILS
1	Camera Mode	Swipe up to toggle Motion/Stills/Playback modes	"Camera Mode" on the next page
2	Histogram	Histogram; tap to open the Tools menu	"Histogram" on page 46
3	Project Status Indicators	Tap to open the Project Status menu	Project Status
		Camera sensor and core temperature	"Sensor Calibration" on page 49
		Cal: T/E	"CAL: T/E Indicator" on page 47
		HDRX®: Displays when HDRX mode is on	HDRX Menu
		False Color Mode: Displays modes	False Color Modes
		Magnify mode	Display Modes: Magnify
		Timecode	"TC Indicator" on page 47
		Genlock	"GEN Indicator" on page 47
		Sync	"SYNC Indicator" on page 47
		RM	"RM (Remote) Indicator" on page 47
		LAN	"LAN Indicator" on page 48
		RIG: Indicates 3D rig metadata is present	N/A
		WIFI: Indicates wireless connection	"WiFi Indicator" on page 48
4	Media Status	Media location and remaining capacity; tap to open the Media Menu	Media Menu
5	Power Status	DC voltage or remaining battery capacity; tap to open the Power menu	"Power Status" on page 48
6	Audio Meter	Audio input and volume; tap to open the Audio menu	Audio Meter (VU Meter)

CAMERA MODE

The Camera Mode allows you to seamlessly toggle between Motion mode, Stills mode, and Playback. To select a camera mode, select the **Camera Mode** icon in the Lower Status Bar, swipe up, and select a camera mode.

NOTE: Setting adjustments made in Stills mode do not affect the settings in Motion mode, and vice versa.

You can select the following camera modes:

- "Motion Mode" below
- "Stills Mode" on the next page
- Playback Menu

MOTION MODE

Motion mode optimizes your camera settings for capturing motion. This mode defaults the camera to Continuous Record. Motion mode includes the following features:

- Motion recording modes:
  - Continuous Record
  - Internal Timelapse Timer
  - Frame Trigger
  - Speed Ramp Mode
  - REDCODE Burst
- Swipe-Up Shortcuts
  - Camera Mode
  - False Color
  - Status
  - Media
  - Power
  - Audio
- Default Motion Preset (RED)

NOTE: For more information, go to Swipe-Up Menu.

STILLS MODE

Stills mode optimizes your camera settings for capturing stills. Stills mode includes the following features:

- Stills recording modes:
    - Multi-Shot
    - Motion + Stills
- Swipe-Up Shortcuts:
    - False Color
    - Status
    - Media
    - Power
    - Auto Focus
    - Auto Exposure
    - Record Mode
- Default Stills Preset (RED)

For more information, go to Swipe-Up Menu.

HISTOGRAM

NOTE: The sharpness setting affects the Histogram, RAW Level Bars, and RAW Clip Meter. For more information, go to Output Sharpness.

This section describes the elements that comprise the Histogram section in the Lower Status Row. This section of the GUI helps ensure that recorded footage is properly exposed.

Tap the Histogram in the Lower Status Row to access the Tools menu. For more information, go to Tools.

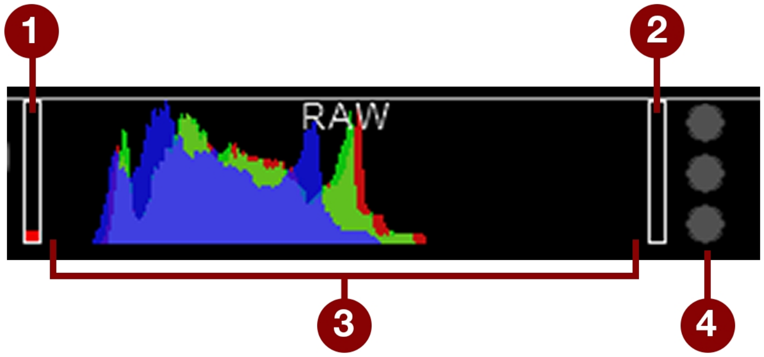


Figure: Histogram (Exposure)

#	ITEM	DESCRIPTION
1	RAW Level Bar (left)[1]	Also known as a “goal post”. Displays the amount of pixels in the image that are underexposed (noise)
2	RAW Level Bar (right)[1]	Also known as a “goal post”. Displays the amount of pixels in the image that are overexposed (clipping)
3	RGB Histogram	Provides a visual representation of exposure and sensor data levels for red, green, and blue channels; meter is affected by White Balance, ISO, and VIEW/LOOK settings
4	RAW Clip Meter	Also known as “traffic lights”. Provides a visual representation of exposure and sensor data levels for red, green, and blue channels; Circles (traffic lights) will light up when clipping occurs

1. The RAW Level Bars represent 1/4 of the total pixels in the image, and illustrate the number of pixels that are noisy or clipped in relation to the total number of pixels. For example, if the left RAW Level Bar is 1/8 of the total height, that means that approximately 1/32 of the total pixels in the total image are at an exposure level that is at risk of displaying noise when pushed to higher ISO or FLUT® values in post production.

PROJECT STATUS INDICATORS

This section describes the colors and behavior of the Project Status indicators in the Lower Status Row. Tap the Project Status indicators in the Lower Status Row to access the Project Status menu. For more information, go to Project Status.

CAL: T/E INDICATOR

The CAL: T/E indicator shows changes to temperature (T) or exposure (E) in relation to the active calibration map. If the temperature or exposure change significantly, calibrate the sensor at the desired temperature and exposure. Failure to properly calibrate the sensor may reduce image quality.

- **Green**: Sensor temperature or exposure are properly calibrated for current settings.
- **Yellow**: Slight change in sensor temperature or exposure.
- **Red**: Significant change in sensor temperature or exposure.
- The - and + indicate whether the sensor temperature or exposure has decreased or increased, respectively.

NOTE: T and E indicators change colors independently of each other.

TC INDICATOR

The TC indicator shows the current timecode status.

- **Grey**: No analog timecode is detected.
- **Red**: Analog timecode is detected but not enabled.
- **Green**: Analog timecode is used to jam the time of day timecode.

For more information, go to Timecode, Genlock, Multi-Camera Setup.

GEN INDICATOR

The GEN indicator shows the current genlock status.

- **Grey**: No genlock signal is detected, or the signal cannot cross-lock to project (24.00 fps vs. 23.98 fps).
- **Red**: During process of sync, or genlock is lost while recording.
- **Green**: A genlock signal matching the current HD-SDI monitor rate is locked.
- **Yellow**: Timing is cross-locked to compatible but not matching monitor rate. For example, genlock is 24.00 fps, and HD-SDI monitor rate is 25.00 fps.

NOTE: When the GEN indicator is yellow, DO NOT perform 3D operation. This warns that genlock source settings and camera settings are not aligned, so phasing of the sync between cameras is not guaranteed.

For more information, go to Timecode, Genlock, Multi-Camera Setup.

SYNC INDICATOR

The SYNC indicator shows the current sensor sync status, based on genlock.

- **Grey**: The sensor sync mode is not set to genlock.
- **Red**: The sensor sync mode is set to genlock, but is not locked to a genlock signal. This may occur if genlock or sensor sync is lost while recording.
- **Green**: The sensor sync mode and HD-SDI monitor rate are locked to a compatible genlock signal.

For more information, go to Timecode, Genlock, Multi-Camera Setup.

RM (REMOTE) INDICATOR

The RM indicator displays if the camera is linked to a third-party remote application, such as foolcontrol.

LAN INDICATOR

The LAN indicator shows the current status of an external LAN connection through the Gig-E port.

- **Grey**: External control of the camera is not enabled.
- **Green**: Ethernet is enabled.

WIFI INDICATOR

The WiFi indicator shows the wireless connectivity status.

- **Grey**: Wireless is disabled.
- **Yellow**: Wireless is not connected.
- **Green**: Wireless is enabled.

For more information, go to WiFi.

POWER STATUS

The Power Status element displays the current supply voltage or remaining battery capacity. Tap the Power Status element to access the Power menu. For more information, go to Power Menu.

DC IN SUPPLY VOLTAGE

When powering the camera via DC power, the current voltage displays. When powering the camera using batteries, the remaining battery capacity displays. The remaining capacity is indicated by the following colors:

- **Green**: 12.0 V and up
- **Yellow**: 11.8 V to 11.9 V
- **Red**: 11.6 V to 11.7 V

NOTE: The camera turns off automatically if the supply voltage drops to 11.5 V.

When using a RED battery, the power status displays the location of the power source and the remaining battery capacity. When using a RED BRICK battery connected to DC IN, the power status displays BRICK and the remaining battery capacity.

The color of the displayed battery capacity represents the amount of time remaining:

- **Green**: >10 minutes
- **Yellow**: 5 to 10 minutes
- **Red**: <5 minutes

CHAPTER 5:

SENSOR CALIBRATION

(missing or bad snippet)

Sensor calibration, also known as black shading, is a process during which the camera optimizes image quality by ensuring that pixel sensitivity remains consistent throughout the sensor. Calibrating the sensor generates a calibration map based on system and environment settings. After calibration, the sensor shows a uniform noise profile over the whole area without any falloffs on any side.

The camera offers two (2) ways to calibrate the sensor:

- **Manual Calibration**: RED recommends using Manual Calibration for the HELIUM 8K S35, MONSTRO 8K VV, and GEMINI 5K S35 sensors. For more information, go to "Calibrate Sensor: Manual Calibration" on the next page.
- **Auto Calibration**: For more information, go to "Calibrate Sensor: Auto Calibration" on page 52.

For more information, see the Sensor Calibration Methods article.

NOTE: Calibration maps are still available after performing a system restore.

WHEN TO CALIBRATE SENSOR

Calibration is required:

- After an extreme change in temperature (+/- 30°F or +/-15°C) from the current calibration map.
- After an extreme change in exposure time (+/- 1/2 sec) from the current calibration map.
- If either the T or E in the CAL: T/E indicator is not green.
- After each firmware upgrade.

To check the temperature/exposure of the current calibration file, go to **Menu** > **Settings** > **Maintenance** > **System Status** > **Project Status**.

CALIBRATE SENSOR: MANUAL CALIBRATION

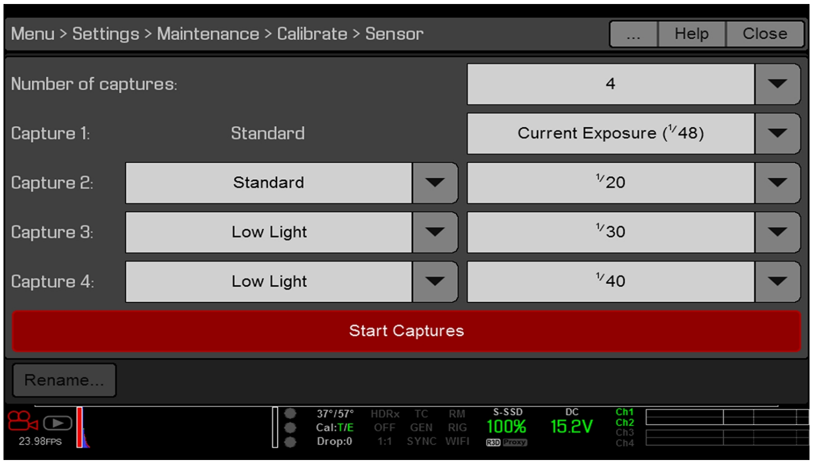
The camera offers two (2) ways to calibrate the sensor: Manual Calibration and Auto Calibration. This section describes how to calibrate the sensor with Manual Calibration.

When you start a Manual Calibration, the camera calibrates the sensor at the current exposure and temperature setting. You will need to re-calibrate the sensor after extreme changes in exposure and temperature. The Manual Calibration process takes several minutes.

MANUAL CALIBRATION PROCEDURE

To perform a Manual Calibration, follow the instructions below:

1. Ensure that the camera reaches the temperature that you want to use for your shoot.
2. Set the exposure to the exposure that you want to use for your shoot.
3. Ensure that the sensor is as dark as possible.
    - Preferably, take off the lens, and install the front body cap.
    - If you cannot take off the lens, put a lens cap on the lens. (Not all lens caps completely block IR. Lens caps are made to protect the lens, not necessarily to block light.)
    - If possible, use a dark room.
    - Just closing the aperture is NOT sufficient.
4. Go to **Menu** > **Settings** > **Maintenance** > **Calibrate** > **Sensor** > **Create** > **Manual**.
5. Select how many calibration maps that you want to create from the **Number of captures** drop-down menu. You can create up to four (4) calibration maps at a time.
6. Select the exposure that you want for each calibration map from the **Capture** drop-down menus.
7. Select **Start Captures**.



Menu > Settings > Maintenance > Calibrate > Sensor

Number of captures: 4

Capture 1: Standard — Current Exposure (1/48)

Capture 2: Standard — 1/20

Capture 3: Low Light — 1/30

Capture 4: Low Light — 1/40

Figure: Manual Capture Settings

8. Select **OK** on the dialog box that opens. The system initializes and then makes multiple passes through the following phases of the calibration:
    - Capturing
    - Analyzing
    - Erasing
    - Programming
9. When the Calibration Successful dialog displays, select **OK** to complete the process.

    The new calibration map is automatically selected.

CALIBRATE SENSOR: AUTO CALIBRATION

NOTE: The camera cannot export calibration maps created by Auto Calibration.

The camera offers two (2) ways to calibrate the sensor: Manual Calibration and Auto Calibration. This section describes how to calibrate the sensor with Auto Calibration.

When you start an Auto Calibration, the camera calibrates the sensor at 16 exposure settings, and uses that data to build a calibration curve. Afterward, the sensor is calibrated for each exposure along the calibration curve, so you do not need to re-calibrate every time you change the exposure.

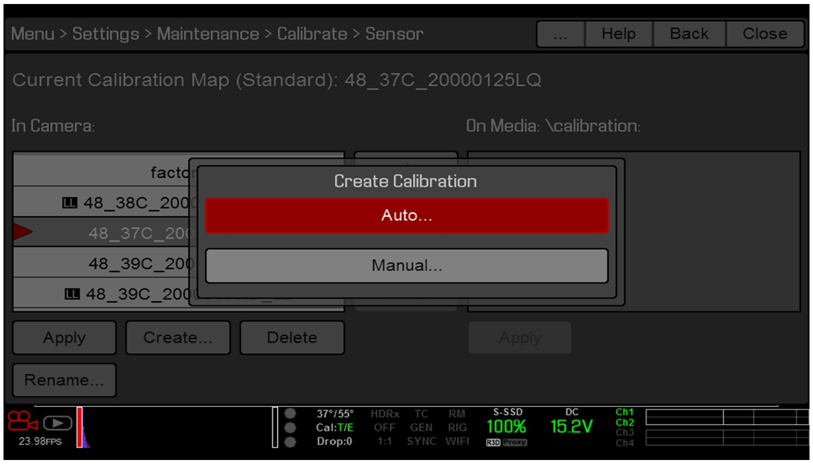
The calibration process does not factor in multiple temperatures, so you will need to re-calibrate the sensor after extreme changes in temperature.

This process can take up to 1 hour.

AUTO CALIBRATION PROCEDURE

To perform an Auto Calibration, follow the instructions below:

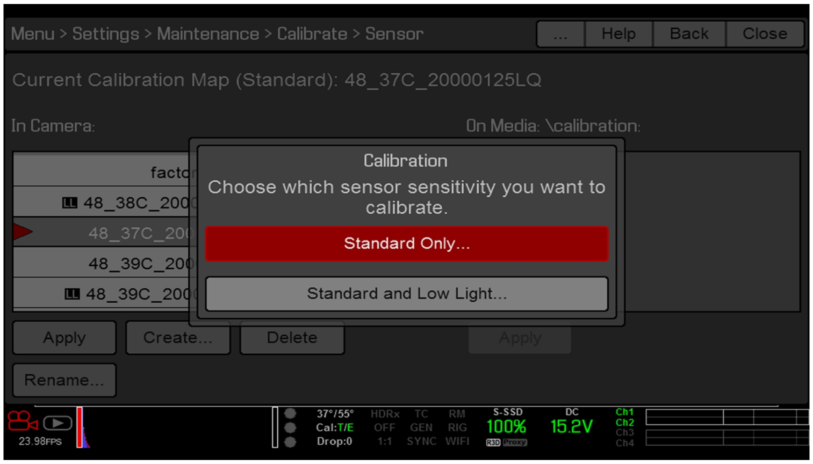
1. Ensure that the camera reaches the temperature that you want to use for your shoot.
2. Ensure that the sensor is as dark as possible.
    - Preferably, take off the lens, and install the front body cap.
    - If you cannot take off the lens, put a lens cap on the lens. (Not all lens caps completely block IR. Lens caps are made to protect the lens, not necessarily to block light.)
    - If possible, use a dark room.
    - Just closing the aperture is NOT sufficient.
3. Ensure a properly formatted SSD is attached to the camera.
4. Go to **Menu** > **Settings** > **Maintenance** > **Calibrate** > **Sensor** > **Create** > **Auto**.


Current Calibration Map (Standard): 48_37C_20000125LQ

Menu > Settings > Maintenance > Calibrate > Sensor
...
Help
Back
Close
In Camera:
On Media: \calibration:
facto
48_38C_200
48_37C_20
48_39C_200
48_39C_200
Create Calibration
Auto...
Manual...
Apply
Create...
Delete
Apply
Rename...
23.98FPS
37°/55°
Cal:T/E
Drop:0
HDRx OFF
TC GEN
RM RIG
1:1
SYNC
WIFI
S-SSD
100%
DC
15.2V
Ch1
Ch2
Ch3
Ch4

Figure: Select Auto

5. Select which Sensor Sensitivity you want to calibrate at:
    - **Low Light Only**: This option displays when the current Sensor Sensitivity is Low Light.
    - **Standard Only**: This option displays when the current Sensor Sensitivity is Standard.
    - **Standard and Low Light**: This option always displays.


Menu > Settings > Maintenance > Calibrate > Sensor
...
Help
Back
Close
In Camera:
On Media: \calibration:
facto
48_38C_200
48_37C_200
48_39C_200
48_39C_200
Standard Only...
Standard and Low Light...
Apply
Create...
Delete
Apply
Rename...
23.98FPS
37°/55°
Cal:T/E
Drop:0
HDRx OFF
TC GEN 1:1 SYNC
RM RIG WIFI
S-SSD 100%
DC 15.2V
Ch1
Ch2
Ch3
Ch4

Current Calibration Map (Standard): 48_37C_20000125LQ

Calibration

Choose which sensor sensitivity you want to calibrate.

Figure: Select Sensor Sensitivity for Auto Calibration

6. Select **OK** on the dialog box that opens. The system initializes and then makes multiple passes through the calibration phases.
7. When the Calibration Successful dialog displays, select **OK** to complete the process.

NOTE: When you change the exposure setting, the E indicator turns yellow and it may take up to 8 seconds for the calibration map to load.

CALIBRATION MAP NAMING CONVENTIONS

All calibration maps for Low Light Sensor Sensitivity are marked with the "LL" symbol.

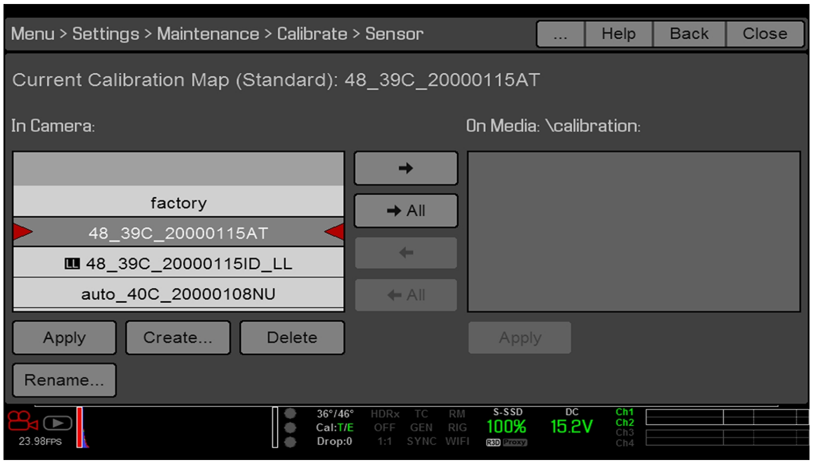
Each calibration map has a unique name that uses the format described in the table below:

NAME	DESCRIPTION	EXAMPLE
Exposure	Current exposure; to set exposure, go to Exposure/Shutter If the calibration map was created using Auto Calibration, then "auto" displays instead of an exposure setting	48 auto
Sensor Temperature	Sensor temperature (Celsius); in the Lower Status Row, this is the number to the left of the forward slash (Temp: 32/35)	32C
Year	Year that the calibration map is created (yyyy)	2014
Month	Month that the calibration map is created (mm)	01
Day	Day that the calibration map is created (dd)	28
Letters	Two random alphanumeric characters generated by the camera to prevent any possibility of duplicate names being created	LQ
Low Light Indicator	All calibration maps for Low Light Sensor Sensitivity have the suffix "_LL"	LL

For example, a set of calibration maps may look like this:

- 48_39C_20000115AT
- 48_39C_20000115ID_LL
- auto_40C_20000108NU
- 48_38C_200001257A_LL

NOTE: If you mount an SSD with calibration files to your computer, each calibration map displays as a sub-folder in a folder called Calibration. To save a calibration map to your hard drive, copy the entire sub-folder to your drive.


Current Calibration Map (Standard): 48_39C_20000115AT

In Camera:

- factory
- 48_39C_20000115AT
- LL 48_39C_20000115ID_LL
- auto_40C_20000108NU

On Media: \calibration:

Menu > Settings > Maintenance > Calibrate > Sensor
...
Help
Back
Close
→
→ All
←
← All
Apply
Create...
Delete
Rename...
Apply
23.98FPS
36°/46°
Cal:T/E
Drop:0
HDRx OFF 1:1
TC GEN SYNC
RM RIG WIFI
S-SSD 100%
R3D Proxy
DC 15.2V
Ch1
Ch2
Ch3
Ch4

Figure: Sensor Calibration Menu

CALIBRATION MANAGEMENT

To apply, export, and import calibration maps, go to **Menu** > **Settings** > **Maintenance** > **Calibrate** > **Sensor**.

- **In Camera**: The calibration maps that are saved internally on the camera:
  - **Factory**: This is the calibration map generated during the manufacturing process. (Default)
  - **All other**: The user-created calibration maps.
- **Media**: The calibration maps that are on the SSD in the path shown (for example, S-SSD\calibration).

CALIBRATION MAP ACTIONS

NOTE: You cannot delete or rename the factory map.

- **Apply**: Apply the selected calibration map (if the calibration map is on the SSD, the camera applies the map temporarily, and does not import it into the camera). You can only apply a calibration map for the current Sensor Sensitivity. For example, if a Low Light ISO is selected, you can only apply a calibration map created with Low Light. For more information on Sensor Sensitivity, go to Sensor Sensitivity.
- **Create**: Create a calibration map. For more information, go to "Calibrate Sensor: Manual Calibration" on page 50 and "Calibrate Sensor: Auto Calibration" on page 52.
- **Delete**: Delete the selected camera calibration map.
- **Rename**: Rename the selected calibration map.

EXPORT AND IMPORT CALIBRATION MAPS

NOTE: The camera cannot export calibration maps created by Auto Calibration.

Calibration maps can be stored on the camera or transferred to SSD. You can also build a library of calibration maps to use in different settings. A camera only imports calibration maps that it created. Calibration maps cannot be shared between cameras.

- ➡ : Export selected calibration map from camera to SSD.
- ➡ **All**: Export all files from camera to SSD.
- ⬅ : Import selected calibration map from SSD to camera. This overwrites the user HS calibration map.
- ⬅ **All**: Import all files from SSD to camera.

CHAPTER 6:

UPGRADE CAMERA FIRMWARE

Your camera functionality may be upgraded by installing the latest firmware. Make a habit of frequently visiting RED Downloads at www.red.com/downloads to check for new versions of camera firmware, updated operation guides, and post production software.

VERIFY CURRENT CAMERA FIRMWARE

To see the firmware version that is currently installed on your camera, go to **Menu** > **Settings** > **Maintenance** > **System Status** > **Camera Info**. A higher number reflects a later release.

UPGRADE CAMERA FIRMWARE

Install the most recent firmware. Unless otherwise specified in the release notes, you do not need to upgrade to any firmware in between your current version and the most recent version available online.

NOTE: You must calibrate the sensor after upgrading the camera. For more information, go to "Sensor Calibration" on page 49.

NOTE: Preset, Look, and Custom Overlay files are preserved across upgrades to v6.2.3 or later.

NOTE: On Mac® computers with REDCINE-X PRO® installed, RED Watchdog mounts the SSD as Read-Only by default, which means that you are unable to write files (including firmware upgrade files) to the SSD. Change the **Mount** preference to **Read-Write** before attempting to copy firmware to the SSD.

1. Connect an SSD (RED MINI-MAG®) to your computer.
2. Download the most recent firmware for your camera from RED Downloads at www.red.com/downloads.
3. Unzip the firmware zip file.
4. Copy the **force_upgrade** folder and its contents to the top level of the SSD directory.
5. Eject or unmount the SSD, and then remove the SSD.
6. Ensure that the camera is turned off.
7. Insert the SSD with the force_upgrade folder into your camera.

8. Turn on the camera.

   The upgrade runs automatically.

   During upgrade, the fans run at high speed and the PWR and REC LEDs flash green. After approximately 15 seconds, the LEDs stop flashing and the camera turns off. Nothing displays on the external monitors during the upgrade.
9. After the camera turns off, remove the SSD and wait 10 seconds.
10. Turn on the camera.

    The camera may take 30 seconds or longer to upgrade all of the attached RED devices. During this time the PWR and REC LEDs flash green and nothing displays on the external monitors.
11. If this is your first time upgrading firmware, a pop-up menu opens with the Software License Agreement (SLA). Select **Agree**. If you do not agree to the SLA, the camera cannot be used. The SLA continues to display until it is accepted.
12. Verify that the firmware version listed matches the firmware version that you downloaded. For more information, go to "Verify Current Camera Firmware" on the previous page.
13. Reformat the SSD before recording.

CHAPTER 7:

CAMERA SYSTEM MAINTENANCE

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All products are designed for rugged durability, but precision instruments demand proper care. Follow the instructions in this chapter to clean, maintain, and store your devices.

WARNING: DO NOT rinse or immerse the camera or other accessories in water. Keep dry at all times.

WARNING: DO NOT use soaps, detergents, ammonia, acetone, alkaline cleaners, abrasive cleaning compounds, or solvents. These substances may damage lens coatings and electronic circuitry.

WARNING: DO NOT use an excess of cleaning solution.

WARNING: DO NOT reuse swabs or wipes.

WARNING: DO NOT attempt to clean the sensor or optical cavity for any reason. If the sensor becomes dirty, submit a Support ticket at https://support.red.com.

WARNING: DO NOT attempt to modify, dismantle, or open the camera, lens, or other accessory as doing so may expose you to electric shock and serious injury. There are no user-serviceable parts inside. Alteration or repairs made to the camera, lens, or other accessory, except by a RED®authorized service facility, voids all warranties.

WARNING: Use caution with compressed air and gas dusters, since the high pressure, oily residue, cold air, particulates, and moisture may cause damage. You may use a filtered, non-residue gas duster to clean non-critical areas, such as around the fans and other recesses on the exterior of the camera. Damage to the camera or other components of the camera system caused by using compressed air or gas dusters is not covered under warranty.

WARNING: DO NOT use compressed air and gas dusters on the sensor or on any optics.

WARNING: DO NOT use compressed air and gas dusters on or around the integrated microphones on the front of the camera.

CAMERA BODY AND ACCESSORY EXTERIOR SURFACES

- Use a filtered, non-residue gas duster to clean non-critical areas, such as around the fans and other recesses on the exterior of the camera.
- Clean with a dry lint-free cloth. When cleaning your camera and accessories, remember that the devices are not waterproof and moisture can damage electronic circuitry.

STORAGE

RED recommends that you store the camera and accessories in the water-resistant cases available in the RED Store at www.red.com/store. These cases feature laser-cut foam to keep the camera and accessories secure.

WARNING: DO NOT store the camera or accessories in any place with extreme temperatures, direct sunlight, high humidity, severe vibration, or strong magnetic fields.

CLEAN EVF SCREEN

NOTE: This section describes only how to clean the screen on the DSMC2® RED EVF, and not how to clean the entire device.

This section explains how to clean the screen on the DSMC2 RED EVF. The screen is accessed by removing the DSMC2 RED EVF Modular Optical Block.

Use an ionized rubber air bulb to clean the screen on the DSMC2 RED EVF. If there are still particles on the screen after using an air bulb, gently wipe the screen with a rolled-up, particulate-free, non-abrasive optical-grade wipe.

NOTE: Cleaning the screen without first removing solid particles increases the risk of scratching the screen. As with many screens, any type of physical contact with the screen may scratch the surface.

PROHIBITED EVF SCREEN CLEANERS

DO NOT use any of the items listed below to clean the screen on the DSMC2 RED EVF. These products have not been tested on RED products and may cause damage or streaking.

- Compressed air
- Gas dusters
- Solvents
- Rubbing alcohol
- Isopropyl alcohol
- Windex®
- Third-party cleaning kits
- Pre-packaged lens cleaner containing any additives, such as detergent, anti-static compounds, or fragrance
- RED Microfiber Bag

WARNING: Damage to any screens or other components of the camera system caused by using prohibited cleaners is not covered under warranty.

CLEAN LCD SCREENS

NOTE: This section describes only how to clean the screen on each specified device, and not how to clean the entire device.

This section explains how to clean the screens on the following devices:

- RED PRO LCD
- RED Touch LCD
- RED PRO Touch LCD
- Camera Side LCD

APPROVED LCD SCREEN CLEANERS

Use only the following products to clean LCD screens:

- Ionized rubber air bulb
- Delkin Devices Sensor Solution®
- Lens swabs
- Dry optical wipes
- RED Microfiber Bag

NOTE: Before cleaning the screen with swabs or wipes and a cleaning solution, ALWAYS use an ionized rubber air bulb to remove any solid particles. Cleaning the screen without removing solid particles increases the risk of scratching the screen.

PROHIBITED LCD SCREEN CLEANERS

DO NOT use any of the items listed below to clean LCD screens. These products have not been tested on RED products and may cause damage or streaking.

- Compressed air
- Gas dusters
- Solvents
- Rubbing alcohol
- Isopropyl alcohol
- Windex
- Pancro Professional Lens Cleaner (or equivalent)
- Third-party cleaning kits
- Pre-packaged lens cleaner containing any additives, such as detergent, anti-static compounds, or fragrance

WARNING: Damage to any screens or other components of the camera system caused by using prohibited cleaners is not covered under warranty.

SCREEN STORAGE

Store any RED device with a screen in a RED Microfiber bag. Storing devices in a RED Microfiber bag preserves the superior quality of the specialized AR and AS coatings on the LCDs.

Hand wash and air-dry the RED Microfiber bag regularly.

WATER DAMAGE

When your device comes in contact with water, or when you suspect water damage, submit a Support ticket at https://support.red.com immediately.

WARNING: DO NOT attempt to power any device that may have water damage.

WARNING: DO NOT place the device in a container of rice, silica gel, or desiccant packets in an attempt to dry the device.

CHAPTER 8:

TROUBLESHOOT YOUR CAMERA

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PERFORM A STRESS TEST

Perform a stress test before important projects to ensure the reliability and stability of your gear. A stress test subjects your camera system and equipment to the increased stress of prolonged operation. If any components are developing issues, this test will help identify those problems before you have an equipment failure during a major shoot.

1. Configure your camera.
2. Calibrate the sensor. For more information, go to "Sensor Calibration" on page 49.
3. Enable the Sensor Test Pattern. For more information, go to Enable/Disable Sensor Test Pattern.
4. Select the desired resolution.
5. Select the highest available frame rate.
6. Perform a secure format of the SSD.
7. Record a full SSD of footage.
8. Perform a secure format of the SSD.
9. Repeat Step 6 to Step 8 to test multiple SSDs.
10. If any errors occur, save a log file and submit a Support ticket at https://support.red.com.

NOTE: Problems or dropped frames found during the stress test display as “Errors” in the bottom of the user interface.

GENERAL TROUBLESHOOTING

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FIRMWARE DOES NOT UPGRADE

SYMPTOM

- During an attempt to upgrade firmware, the PWR and REC LEDs flash red.
- After an attempt to upgrade firmware, the firmware version does not change.

POTENTIAL RESOLUTIONS

- After downloading the firmware upgrade file, ensure that you unzip the file before saving it to the SSD.
- Ensure that the “force_upgrade” folder is saved to the top level of the SSD, and not to a subfolder.

GENERAL: LENS MOUNT NOT FUNCTIONING

SYMPTOM

The lens mount is not functioning correctly, or is not communicating with the camera.

POTENTIAL RESOLUTIONS

- Perform a Hardware Rediscover. For more information, go to Rediscover (Hardware Rediscover).
- Upgrade your camera firmware. For more information, go to "Upgrade Camera Firmware" on page 56.
- Reset your camera's default settings. For more information, go to Reset Defaults.

CAMERA DOES NOT RECOGNIZE LENS

SYMPTOM

The camera does not recognize the attached lens.

POTENTIAL RESOLUTIONS

- Ensure that the lens is compatible. For more information, go to "Lenses" on page 88.
- If using a PL lens, ensure that the camera is providing power to the lens: go to **Menu** > **Settings** > **Setup** > **Lens** and select the **Enable Power to Lens** check box.
- Detect the lens: go to **Menu** > **Settings** > **Setup** > **Lens** and select **Detect Lens**.
- Perform a Hardware Rediscover. For more information, go to Rediscover (Hardware Rediscover).

CAMERA DISPLAYS N/A FOR APERTURE

SYMPTOM

The camera displays N/A for aperture when a lens is attached.

POTENTIAL RESOLUTIONS

- Ensure that your lens is completely locked in place.
- Remove your lens mount. Check the connection points for damage or debris. Install your lens mount.
- Perform a Hardware Rediscover. For more information, go to Rediscover (Hardware Rediscover).
- Re-install your camera firmware.
- If your camera is on beta firmware, downgrade to the release build.
- If you are using a DSMC PL mount, go to **Menu** > **Settings** > **Setup** > **Lens** and ensure that power is enabled.

NOTE: Some lenses do not display the aperture information because they are incompatible. Some PL lenses do not have i-technology data.

CANNOT SEE MENUS ON LCD TOUCHSCREEN

SYMPTOM

The LCD touchscreen does not display menus.

POTENTIAL RESOLUTION

Double-tap the LCD touchscreen to exit Clean mode.

SCREEN FREEZES OR DOES NOT DISPLAY

SYMPTOM

The screen freezes or does not display.

POTENTIAL RESOLUTION

Perform a Hard Restore. For more information, go to "Perform a Hard Restore" on page 65.

INTERMITTENT MOTION JITTER

SYMPTOM

A slight, intermittent motion jitter displays on the monitor.

POTENTIAL RESOLUTIONS

If you calibrate the sensor using the Auto Calibration method, the calibration map updates in the background when camera settings change. The update may cause slight, intermittent motion jitter to the image on the monitor. The jitter characteristic only displays in live preview, and does not affect recorded footage. For more information on sensor calibration, go to "Sensor Calibration" on page 49.

LCD FLICKER

SYMPTOM

The LCD or monitor is flickering.

POTENTIAL RESOLUTIONS

- Set the LCD frequency to 60 Hz. For more information, go to Frequency.
- Use a different cable.
- Ensure cables are properly attached.

LCD BLANK AT STARTUP

SYMPTOM

When you turn on the camera, the LCD does not show any image.

POTENTIAL RESOLUTIONS

Turn off the camera. Wait at least three (3) seconds, and then turn the camera back on.

CANNOT USE TOUCHSCREEN

SYMPTOM

Cannot control the camera via the touchscreen or the Side LCD.

POTENTIAL RESOLUTIONS

- Perform a Hard Restore. For more information, go to "Perform a Hard Restore" on the next page.
- If you are using an external monitor, enable menus on the monitors and control the camera via the Side LCD:
  - Connect an SSD (RED MINI-MAG®) to your computer.
  - On the SSD, create a new folder, and name it **force_preset**.
  - Download the DSMC Toolkit from www.red.com/downloads.
  - Open the **Preset_Files** folder.
  - Open the folder that corresponds to the firmware version you are using.
  - Save the appropriate **enable_menus** file to the **force_preset** folder on your SSD.
  - Eject or unmount the SSD, and then remove the SSD.
  - Ensure that the camera is turned off.
  - Insert the SSD into your camera.
  - Turn on the camera. The camera automatically applies the preset.

NOTE: On Mac® computers with REDCINE-X PRO® installed, RED® Watchdog mounts the SSD as Read-Only by default, which means that you are unable to write files (including firmware upgrade files) to the SSD. Change the **Mount** preference to **Read-Write** before attempting to copy firmware to the SSD.

TIGHTEN DC IN CONNECTOR

SYMPTOM

The DC IN connector nut is loose.

POTENTIAL RESOLUTIONS

- Tighten the loose DC IN connector nut using a pair of heavy duty strong point tweezers.

WARNING: DO NOT OVERTIGHTEN.

- **Optional**: Add a small amount of Loctite® 222 (low strength thread locker) to the threads of the DC IN connector nut to prevent the connector from becoming loose again.

CAMERA DOES NOT TURN ON

SYMPTOM

The camera does not turn on (does not boot up), even when powered.

POTENTIAL RESOLUTIONS

- Remove all accessories and power the camera using the power adaptor.
- Perform a Hard Restore. For more information, go to "Perform a Hard Restore" on the next page.
- Remove all accessories and power the camera using the power adaptor.

PERFORM A HARD RESTORE

A common way to resolve camera firmware issues is to perform a Hard Restore. A Hard Restore functions like a System Restore in that it changes all settings to the factory default values.

To perform a Hard Restore, follow the instructions below:

1. With the camera turned off, hold the **PWR/REC** key on the camera for 20 seconds or until the fans turn at a high speed.
2. Release the **PWR/REC** key.

   The screen displays correctly.

   NOTE: User key settings reset as well as any other changes from the default settings.

IMAGE APPEARS GRAINY

SYMPTOM

Image or footage appears grainy.

POTENTIAL RESOLUTIONS

- Calibrate the sensor before recording additional clips. For more information, go to "Sensor Calibration" on page 49.
- Check the histogram to ensure proper exposure. Noise occurs if an image is overexposed or underexposed.
- Use the lowest REDCODE® compression possible for the settings you have selected.
- Use a higher resolution.
- Use Adaptive fan mode to regulate the camera temperature. Noise occurs when the temperature from the applied calibration map is not in sync.

BLACK AND WHITE IMAGE

SYMPTOM

The display shows that an image is in black and white, and the menus are still in color.

POTENTIAL RESOLUTIONS

- Check the Color Saturation setting. If the Saturation setting is set to a low value, change the Saturation to a higher value.
- Reset your camera’s default settings. For more information, go to Reset Defaults.

INCORRECT COLOR TEMPERATURE

SYMPTOM

The camera color temperature is off and the image looks warmer or cooler than normal.

POTENTIAL RESOLUTIONS

- Perform an auto white-balance. For more information, go to Color Temperature.
- Calibrate the sensor. For more information, go to "Sensor Calibration" on page 49.

TIMECODE OR GENLOCK DOES NOT FUNCTION

SYMPTOM

The SYNC, GEN, and/or TC light is red, yellow, or greyed out.

POTENTIAL RESOLUTIONS

- Ensure that your timecode or genlock device is compatible. For more information, go to Compatible Timecode Devices and Compatible Genlock Devices.
- Use a different cable.
- Ensure that your timecode or genlock device settings match your project settings.
- Ensure that your timecode or genlock device is set to the correct source. For more information, go to Timecode and Genlock.
- Ensure that your Sensor Sync Mode is set to **Genlock**. For more information, go to Sensor Sync.
- Set the ACN (Ambient Clockit Network) to Off.

CAMERA DOES NOT RECOGNIZE OLPF

SYMPTOM

Your camera does not recognize the OLPF.

POTENTIAL RESOLUTIONS

- Reinstall the OLPF. For more information, go to "Swap an Interchangeable OLPF" on page 33.
- Install a different OLPF.
- If your camera still does not recognize the OLPF, submit a Technical Support request at https://support.red.com.

POSSIBLE HOT PIXEL

SYMPTOM

Your camera displays a possible hot pixel.

EXPLANATION

There may not be an issue with the pixel itself. The sensor can display a hot pixel when the sensor calibration is outdated. Current camera settings and temperature can affect pixel calibration.

POTENTIAL RESOLUTIONS

- Delete all user-generated calibration files and recalibrate the sensor. For more information, go to "Sensor Calibration" on page 49.
- Upgrade your camera firmware. For more information, go to "Upgrade Camera Firmware" on page 56.
- Reset your camera’s default settings. For more information, go to Reset Defaults.
- Check your footage on a computer to confirm that the hot pixel is from the camera sensor, not your display monitor.
- If you determine that the camera sensor has a hot pixel, use the Pixel Masking tool in REDCINE-X PRO to remove the hot pixel until the issue gets resolved. For more information, see the REDCINE-X PRO Operation Guide, available at www.red.com/downloads.

NO MON-1 SIGNAL

SYMPTOM

The MON-1 port does not output a signal.

EXPLANATION

The secondary LCD/EVF port (on the side of the camera) and the MON-1 port cannot be used at the same time. For more information, go to Monitor Preferences.

POTENTIAL RESOLUTIONS

- If an LCD or EVF is connected to the secondary LCD/EVF port (on the side of the camera), remove the LCD or EVF.
- Ensure that HD-SDI monitoring/recording is set up correctly. For more information, go to "Record" on page 36.

ERROR MESSAGES

(missing or bad snippet)

“CRITICAL FAILURE” OR “SERIOUS ERROR” MESSAGES

SYMPTOM

When you upgrade or turn on the camera, the display shows a message with the phrase “Critical Failure” or “Serious Error”.

POTENTIAL RESOLUTIONS

- Update the camera firmware to the latest release build available for download at www.red.com/downloads.
- Submit a Support ticket at https://support.red.com. Include the following with the request:
  - Log file. For more information, go to Save Log.
  - List of devices, lens, and third-party accessories that were attached when the error occurred.
  - Method for powering the camera when the error occurred (include battery types, power devices, and power cables).

PRESET COULD NOT BE APPLIED

SYMPTOM

The display shows the following message: “Preset Could Not Be Applied”.

POTENTIAL RESOLUTION

Turn off the camera, power it back up, and attempt to apply the preset that failed.

CANNOT CONTROL CAMERA EXTERNALLY

SYMPTOM

The camera displays the message “For reliable external control over Ethernet your camera’s hardware may need to be upgraded. Please contact your Bomb Squad representative”.

POTENTIAL RESOLUTIONS

If you see this message, submit a Support ticket at https://support.red.com to have your hardware upgraded. You will not be able to control the camera externally until the hardware is upgraded.

ERROR 0X00000020 OR ERROR 0X20

SYMPTOM

The display shows one of the following messages:

- Error 0x00000020. Please save log and send to RED Support.
- ERROR 0x20. Media integrity error. Please secure format the SSD. If the issue persists, save log file and contact RED Support with the log file, method of powering camera, and camera configuration.

POTENTIAL RESOLUTIONS

- Perform a secure format of the SSD. For more information, see the DSMC Media Operation Guide, available at www.red.com/downloads.
- Update the camera firmware to the latest release build available for download at www.red.com/downloads.
- Submit a Support ticket at https://support.red.com. Include the following with the request:
  - Log file. For more information, go to Save Log.
  - List of devices, lens, and third-party accessories that were attached when the error occurred.
  - Method for powering the camera when the error occurred (include battery types, power devices, and power cables).

ERROR 0X01D

SYMPTOM

The display shows the following message: "ERROR 0x01D. Possible hardware error. Please save log file and contact RED Support with the log file and camera configuration."

POTENTIAL RESOLUTIONS

Submit a Support ticket at https://support.red.com. Include the following with the request:

- Log file. For more information, go to Save Log.
- List of devices, lens, and third-party accessories that were attached when the error occurred.
- Method for powering the camera when the error occurred (include battery types, power devices, and power cables).

ERROR 0X11D

SYMPTOM

The display shows the following message: "Media integrity error. Please secure format the SSD. If the issue persists, save log file and contact RED Support with the log file, method of powering camera, and camera configuration."

POTENTIAL RESOLUTIONS

- Perform a secure format of the SSD. For more information, see the DSMC Media Operation Guide, available at www.red.com/downloads.
- Update the camera firmware to the latest release build available for download at www.red.com/downloads.
- Submit a Support ticket at https://support.red.com. Include the following with the request:
    - Log file. For more information, go to Save Log.
    - List of devices, lens, and third-party accessories that were attached when the error occurred.
    - Method for powering the camera when the error occurred (include battery types, power devices, and power cables).

CAMERA KEEPS PROMPTING BLACK SHADE MESSAGE

SYMPTOM

Your camera keeps prompting you to black shade the camera.

POTENTIAL RESOLUTIONS

- Ensure that you complete the sensor calibration process. For more information, go to "Sensor Calibration" on page 49.
- Go to **Menu** > **Settings** > **Maintenance** > **Calibrate** and select **user1 Calibration Map**. Click **Set**.
- Go to **Menu** > **Settings** > **Maintenance** > **Calibrate** and delete all user-created calibration maps. Then reset your camera's default settings. For more information, go to Reset Defaults.

AUDIO BUFFER OVERFLOW WARNING

SYMPTOM

The error message "Audio Buffer Overflow" displays.

POTENTIAL RESOLUTIONS

- Update the camera firmware to the latest release build available for download at www.red.com/downloads.
- Perform a secure format of the SSD. For more information, see the DSMC Media Operation Guide, available at www.red.com/downloads.

  IMPORTANT: Ensure that data is backed up before formatting the media, since formatting erases all data on the SSD.
- Submit a Support ticket at https://support.red.com. Include the following with the request:
    - Log file. For more information, go to Save Log.
    - List of devices, lens, and third-party accessories that were attached when the error occurred.
    - Method for powering the camera when the error occurred (include battery types, power devices, and power cables).
    - List of file formats you were recording to before the error occurred (R3D, Apple ProRes, Avid DNxHD/HR).

PROXY BUFFER OVERFLOW WARNING

SYMPTOM

The error message "Proxy Buffer Overflow" displays.

POTENTIAL RESOLUTIONS

- Update the camera firmware to the latest release build available for download at www.red.com/downloads.
- Select a different recording file format and/or resolution from the Codec menu. For more information, go to Select Record File Format.
- Submit a Support ticket at https://support.red.com. Include the following with the request:
  - Log file. For more information, go to Save Log.
  - List of devices, lens, and third-party accessories that were attached when the error occurred.
  - Method for powering the camera when the error occurred (include battery types, power devices, and power cables).
  - List of file formats you were recording to before the error occurred (R3D, Apple ProRes, Avid DNxHD/HR).

APPENDIX A:

TECHNICAL SPECIFICATIONS

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RED RANGER GEMINI TECHNICAL SPECIFICATIONS

RED RANGER GEMINI	
SPECIFICATION	**DESCRIPTION**
Sensor Type	GEMINI® 15.4 Megapixel Dual Sensitivity CMOS
Effective Pixels	5120 x 3000
Sensor Size	30.72 mm x 18.00 mm (Diagonal: 35.61 mm)
Dynamic Range	16.5+ stops (Both Sensitivities)
Max Data Rates	Up to 300 MB/s using RED MINI-MAG® (480GB, 512GB, 960GB & 1TB)
	Up to 225 MB/s using RED MINI-MAG (120GB & 240GB)
Max Frame Rates[1]	75 fps at 5K Full Height 1.7:1 (5120 x 3000) 96 fps at 5K Full Format (5120 x 2700), 120 fps at 5K 2.4:1 (5120 x 2160) 120 fps at 4K Full Format (4096 x 2160), 150 fps at 4K 2.4:1 (4096 x 1728) 150 fps at 3K Full Format (3072 x 1620), 200 fps at 3K 2.4:1 (3072 x 1296) 240 fps at 2K Full Format (2048 x 1080), 300 fps at 2K 2.4:1 (2048 x 864)
Playback Frame Rates (Project Time Base)	23.98, 24, 25, 29.97, 30, 47.95, 48, 50, 59.94, 60 fps, all resolutions
Best Available REDCODE® Settings[1]	3:1 REDCODE at 5K Full Height (5120 x 3000) and 24 fps 6:1 REDCODE at 5K Full Height (5120 x 3000) and 60 fps 2:1 REDCODE at 5K Full Format (5120 x 2700) and 24 fps 8:1 REDCODE at 5K Full Format (5120 x 2700) and 96 fps 2:1 REDCODE at 4K Full Format (4096 x 2160) and 24 fps 6:1 REDCODE at 4K Full Format (4096 x 2160) and 120 fps
REDCODE RAW Acquisition Formats[2]	5K Full Height 1.7:1 (5120 x 3000), 6:5 and Ana 2x, 1.3x 5K Full Format (5120 x 2700), 2:1, 2.4:1, 16:9, 4:1, 8:1, and Ana 2x, 1.3x 4K Full Format (4096 x 2160), 2:1, 2.4:1, 16:9, 3:2, 4:3, 6:5, 4:1, 8:1, and Ana 2x, 1.3x 3K Full Format (3072 x 1620), 2:1, 2.4:1, 16:9, 3:2, 4:3, 5:4, 6:5, 4:1, 8:1, and Ana 2x, 1.3x 2K Full Format (2048 x 1080), 2:1, 2.4:1, 16:9, 3:2, 4:3, 5:4, 6:5, 4:1, 8:1, and Ana 2x, 1.3x
Apple® ProRes	ProRes 422 HQ, ProRes 422 and ProRes 422 LT at 4K (4096 × 2160) up to 30 fps ProRes 4444 XQ and ProRes 4444 at 2K (2048 × 1080) up to 120 fps ProRes 422 HQ, ProRes 422 and ProRes 422 LT at 2K (2048 × 1080) up to 120 fps

RED RANGER GEMINI	
SPECIFICATION	**DESCRIPTION**
Avid® Codecs	DNxHR HQX at 4K (4096 × 2160) 12-bit up to 30 fps DNxHR HQ and SQ at 4K (4096 × 2160) 8-bit up to 30 fps DNxHR 444 at 2K (2048 × 1080) 12-bit up to 120 fps DNxHR HQ and SQ at 2K (2048 × 1080) 8-bit up to 120 fps DNxHD 444 and HQX (1920 × 1080) 10-bit up to 120 fps DNxHD HQ and SQ (1920 × 1080) 8-bit up to 120 fps
Construction	Aluminum Alloy
Weight	7.30 lbs (with Integrated Media Bay, PL Mount, and Gold Mount) 7.50 lbs (with Integrated Media Bay, PL Mount, and V-Lock)
Operating Temperature	0˚C to 40˚C (32˚F to 104˚F)
Storage Temperature	-20˚C to 50˚C (-4˚F to 122˚F)
Relative Humidity	0% to 85% non-condensing
Color Management	Supports 33×33×33, 32×32×32, 26×26×26, and 17×17×17 3D LUTs Variable number of 3D LUT outputs User programmable shaper 1D LUTs Tetrahedral interpolation, 16-bit processing
Audio	Integrated dual channel digital stereo microphones, uncompressed, 24-bit 48 kHz Integrated dual channel 5-pin XLR, uncompressed, 24-bit 48 kHz
Remote Control	External R.C.P. WiFi antenna with SMA connector Ethernet, RS232, and GPI Trigger
Monitor Outputs	3G-SDI (HD-SDI) and MON-1 1080p RGB or 4:2:2, 720p RGB or 4:2:2 SMPTE Timecode, HANC Metadata, 24-bit 48 kHz Audio
Monitor Options	DSMC2 Touch 7.0" Ultra-Brite LCD (Direct Mount), DSMC2 RED® Touch 4.7" LCD, DSMC2 RED Touch 7.0" LCD, and DSMC2 RED EVF (OLED) with cable-free connection. RED Touch 9.0" LCD, RED Touch 7.0" LCD, RED Touch 5.0" LCD, RED PRO 7" LCD, DSMC2 Touch 7.0" Ultra-Brite LCD, BOMB EVF (OLED) and BOMB EVF (LCOS) compatible with DSMC2 LCD/EVF Adaptor A or DSMC2 LCD/EVF Adaptor D, and LCD/EVF cable.
REDCINE-X PRO® Delivery Formats	4K: DPX, TIFF, OpenEXR (.RED via RRencode plugin) 2K: DPX, TIFF, OpenEXR (.RED via RRencode plugin) 1080p RGB 4:2:2, 720p 4:2:2 : QuickTime®, JPEG, Avid AAF, MXF 1080p 4:2:0, 720p 4:2:0 : H.264, .MP4
Video Editing Software Compatibility[3]	Adobe® Premiere® Pro, Avid Media Composer®, DaVinci Resolve®, Edius Pro®, Final Cut Pro®, Vegas Pro®

1. REDCODE values and max frame rates may vary based on selected acquisition format, aspect ratio, project time base, Look Around setting, and SSD. For more information, see the DSMC Media Operation Guide at www.red.com/downloads.
2. For more information on available acquisition formats, see the DSMC Media Operation Guide at www.red.com/downloads.
3. Third-party non-linear editing (NLE) applications may have limited compatibility with R3D files.

APPENDIX B:
MECHANICAL DRAWINGS

RED RANGER GEMINI WITH V-LOCK

NOTE: Dimensions are shown in mm.

The optical axis height of the camera is 95.90 mm.

FRONT VIEW

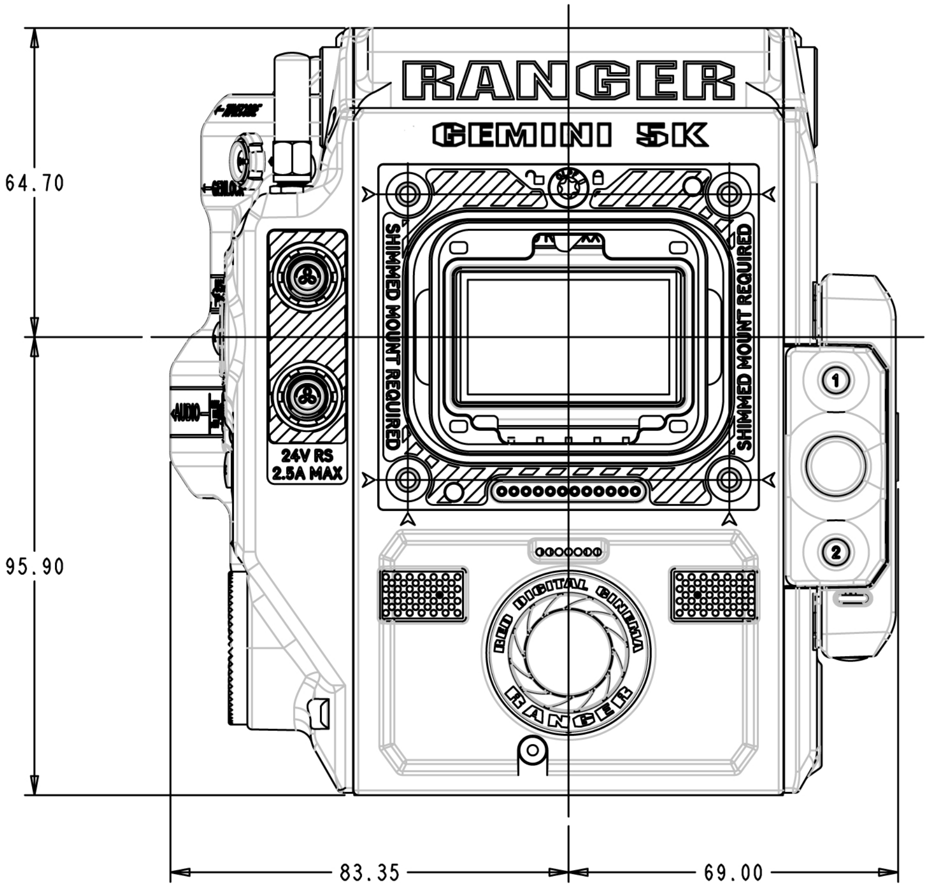
64.70
95.90
83.35
69.00
RANGER
GEMINI 5K
SHIMMED MOUNT REQUIRED
SHIMMED MOUNT REQUIRED
24V RS
2.5A MAX
GENLOCK
AUDIO
RED DIGITAL CINEMA
RANGER
1
2

Figure: Camera Front View

BACK VIEW

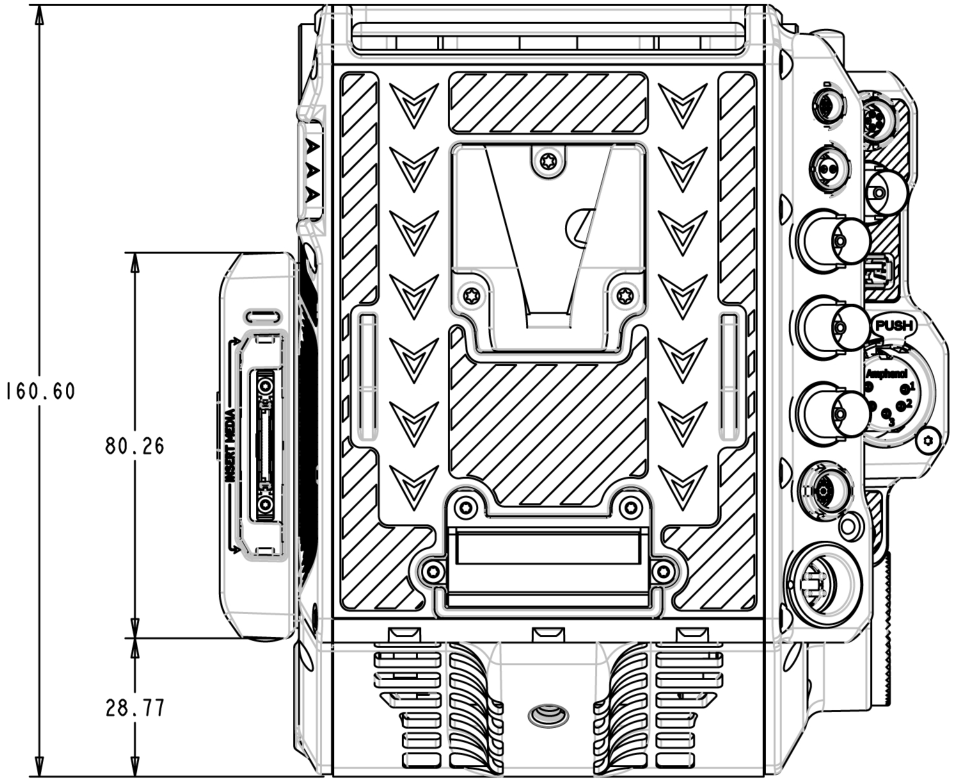
160.60
80.26
28.77
INSERT MEDIA
PUSH
Amphenol
1
2
3

Figure: Camera Back View

SIDE VIEW (RIGHT)

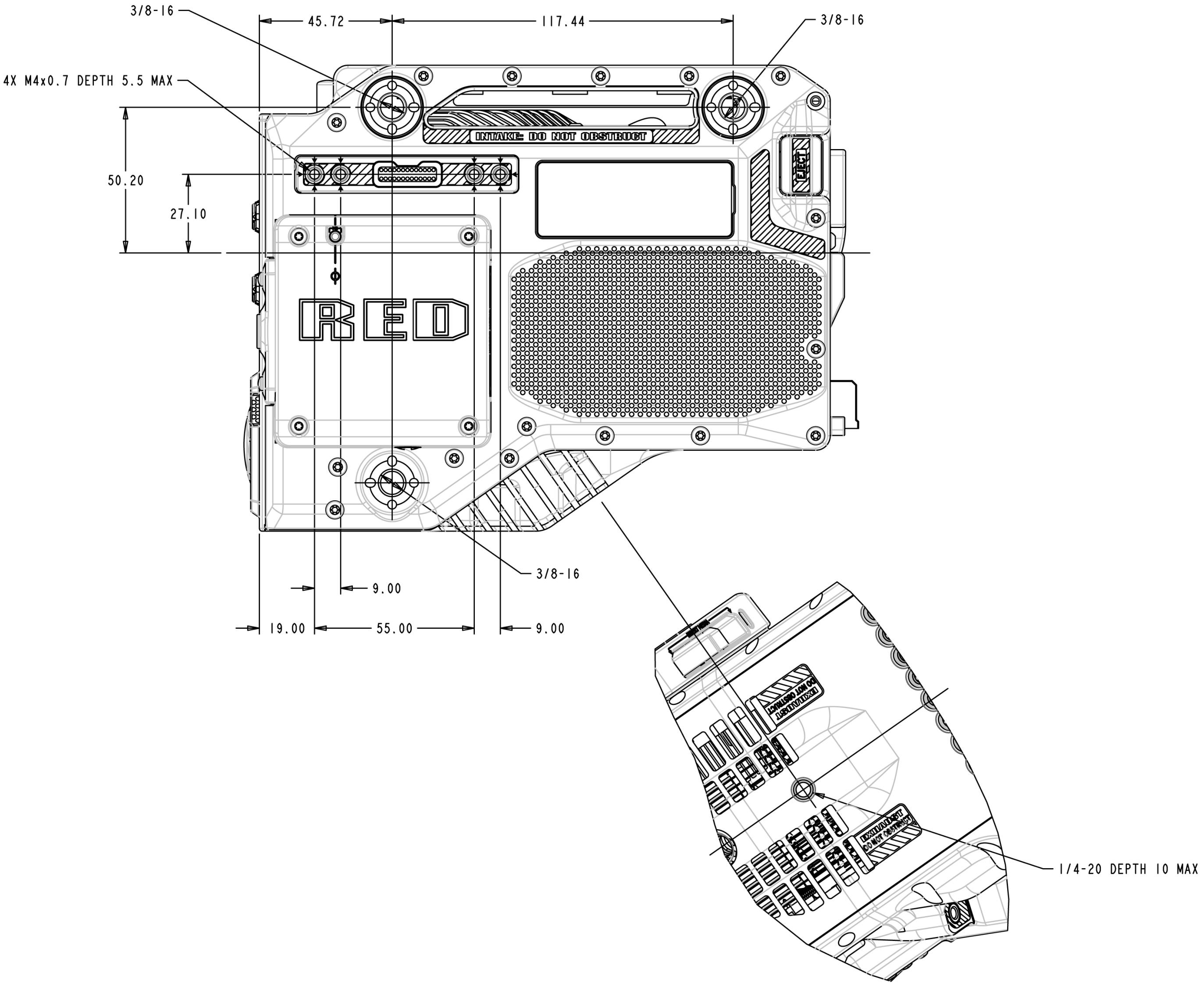
3/8-16
45.72
117.44
3/8-16
4X M4x0.7 DEPTH 5.5 MAX
50.20
27.10
INTAKE: DO NOT OBSTRUCT
EJECT
RED
3/8-16
9.00
19.00
55.00
9.00
EXHAUST: DO NOT OBSTRUCT
1/4-20 DEPTH 10 MAX

Figure: Camera Side View (Right)

SIDE VIEW (LEFT)

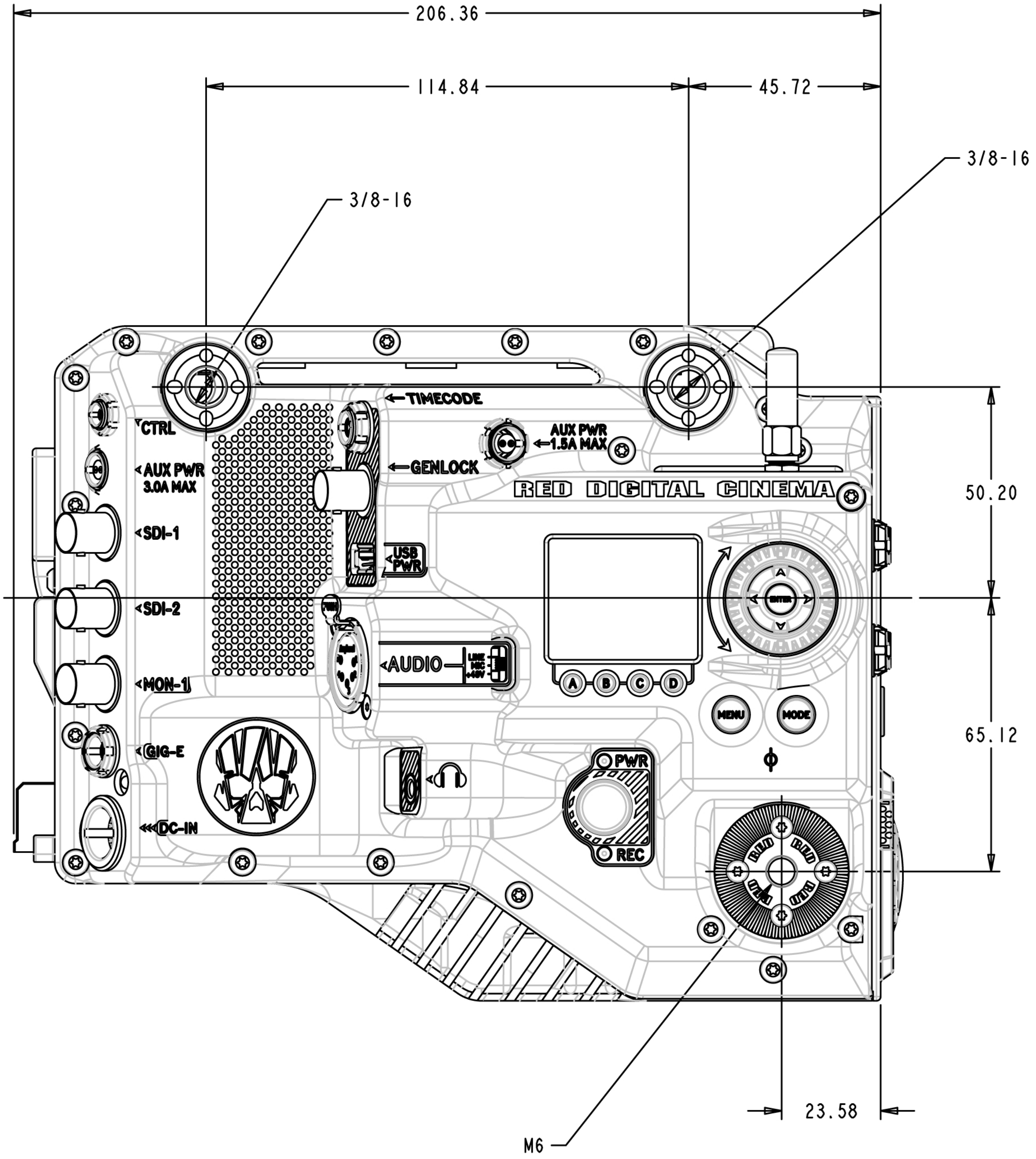
206.36
114.84
45.72
3/8-16
3/8-16
TIMECODE
CTRL
AUX PWR 1.5A MAX
AUX PWR 3.0A MAX
GENLOCK
RED DIGITAL CINEMA
50.20
SDI-1
USB PWR
SDI-2
MON-1
AUDIO
ENTER
A
B
C
D
MENU
MODE
65.12
GIG-E
PWR
DC-IN
REC
23.58
M6

Figure: Camera Side View (Left)

TOP VIEW

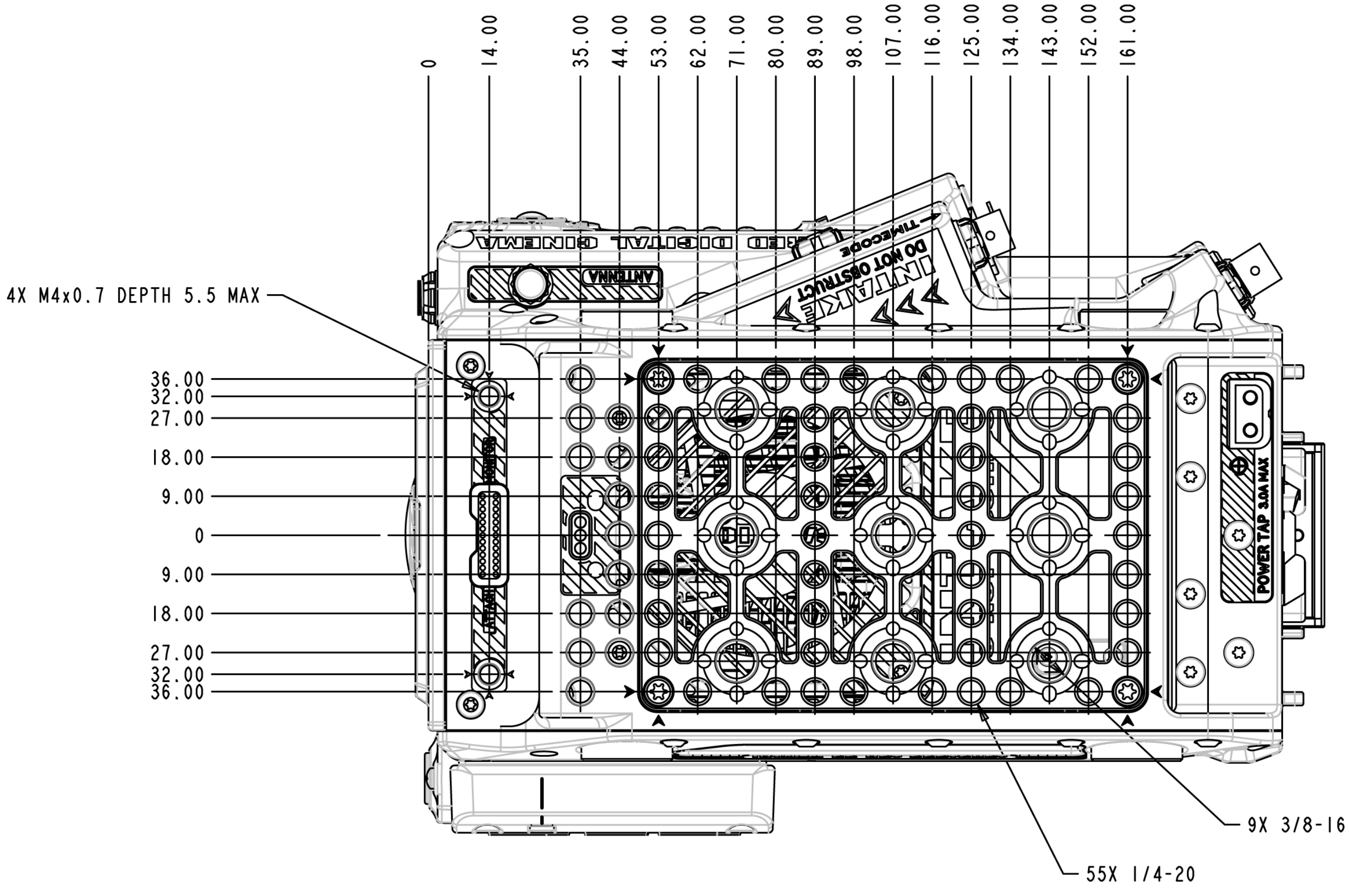
0
14.00
35.00
44.00
53.00
62.00
71.00
80.00
89.00
98.00
107.00
116.00
125.00
134.00
143.00
152.00
161.00
4X M4x0.7 DEPTH 5.5 MAX
36.00
32.00
27.00
18.00
9.00
0
9.00
18.00
27.00
32.00
36.00
RED DIGITAL CINEMA
ANTENNA
TIMECODE
DO NOT OBSTRUCT
INTAKE
POWER TAP 3.0A MAX
9X 3/8-16
55X 1/4-20

Figure: Camera Top View

BOTTOM VIEW

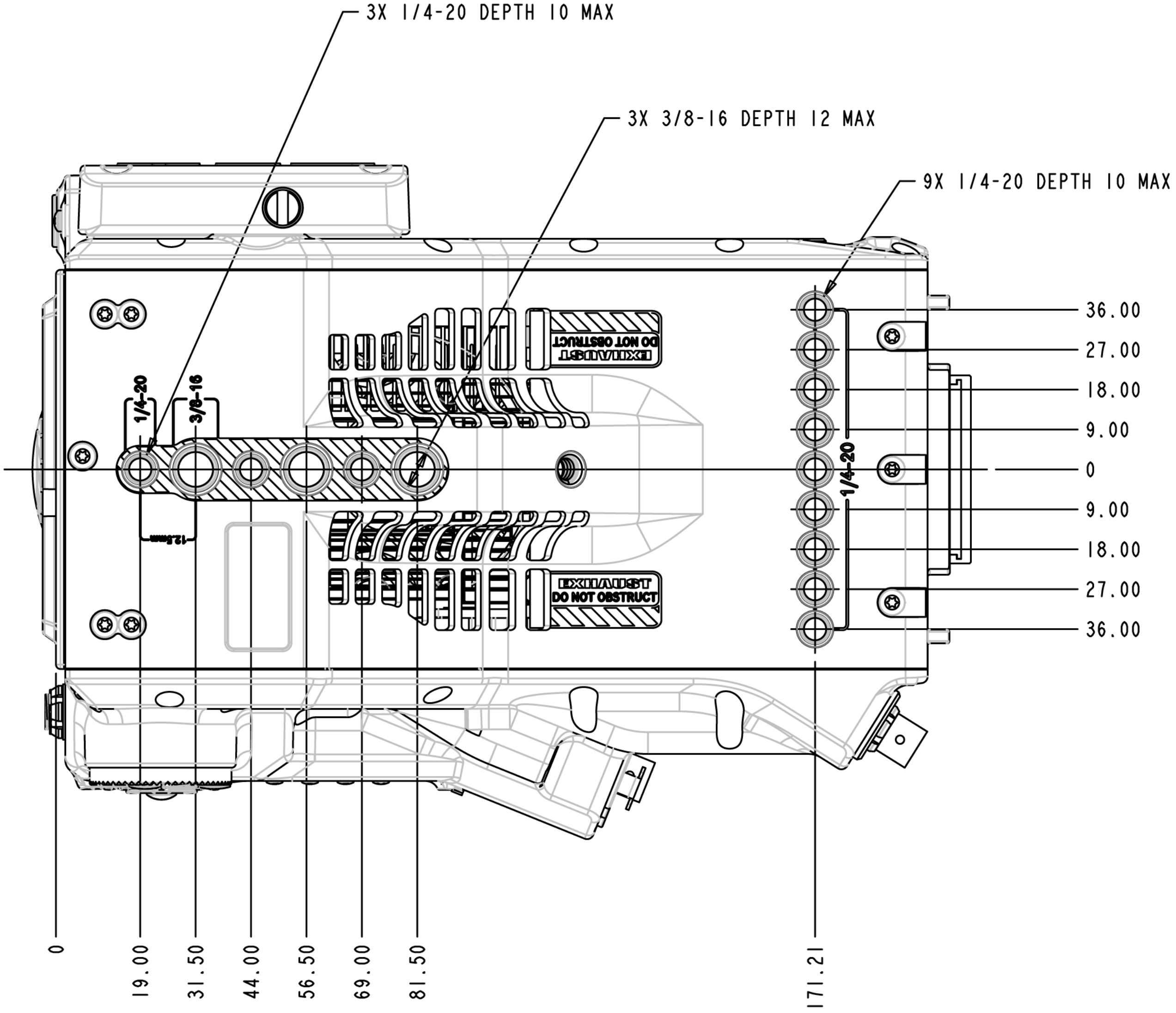
3X 1/4-20 DEPTH 10 MAX
3X 3/8-16 DEPTH 12 MAX
9X 1/4-20 DEPTH 10 MAX
1/4-20
3/8-16
12.5mm
EXHAUST
DO NOT OBSTRUCT
EXHAUST
DO NOT OBSTRUCT
1/4-20
36.00
27.00
18.00
9.00
0
9.00
18.00
27.00
36.00
0
19.00
31.50
44.00
56.50
69.00
81.50
171.21

Figure: Camera Bottom View

RED RANGER GEMINI WITH GOLD MOUNT

NOTE: Dimensions are shown in mm.

The optical axis height of the camera is 95.90 mm.

FRONT VIEW

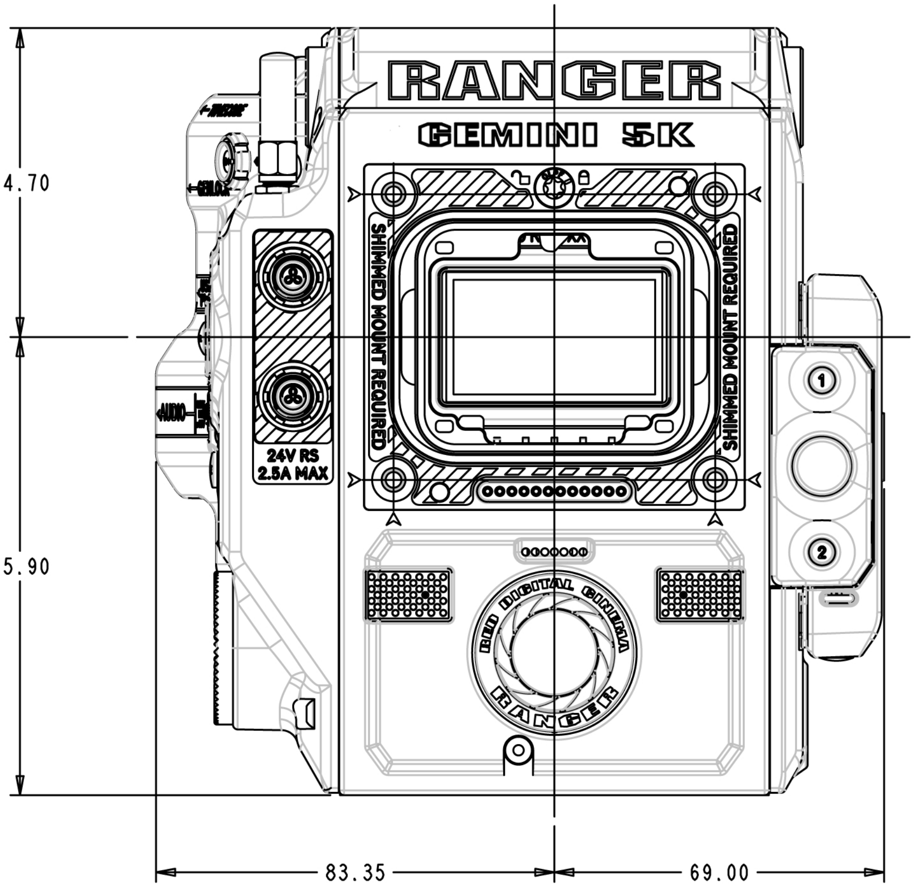
RANGER
GEMINI 5K
SHIMMED MOUNT REQUIRED
SHIMMED MOUNT REQUIRED
24V RS
2.5A MAX
AUDIO
GENLOCK
RED DIGITAL CINEMA
RANGER
1
2
64.70
95.90
83.35
69.00

Figure: Camera Front View

BACK VIEW

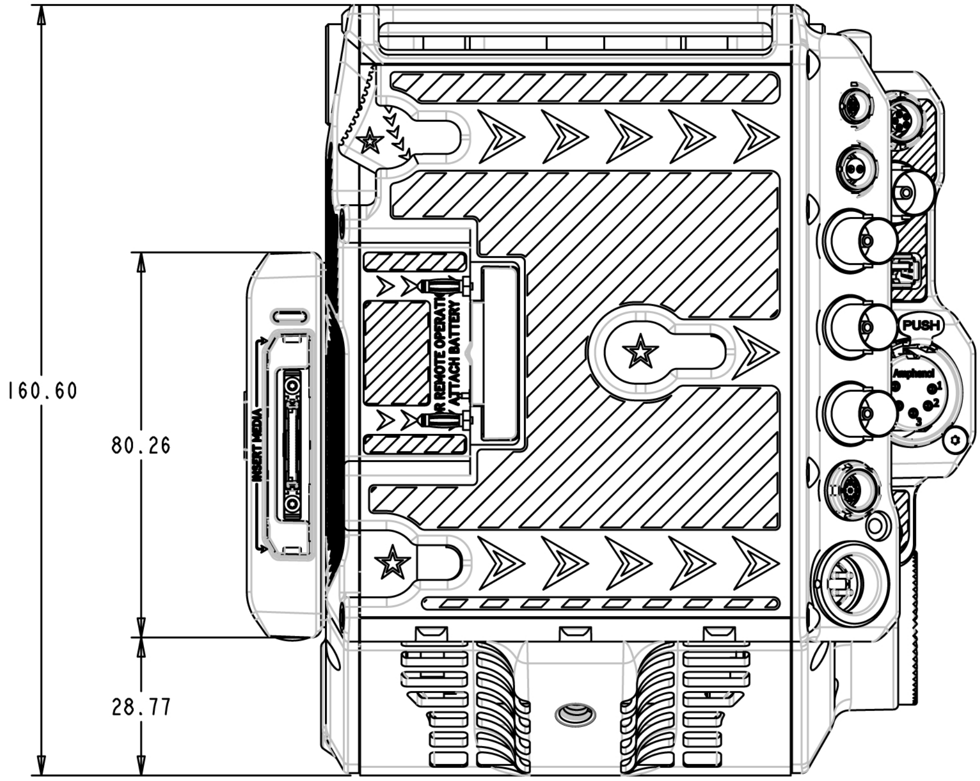
160.60
80.26
28.77
INSERT MEDIA
R REMOTE OPERATI
ATTACH BATTERY
PUSH
Amphenol
1
2
3

Figure: Camera Back View

SIDE VIEW (RIGHT)

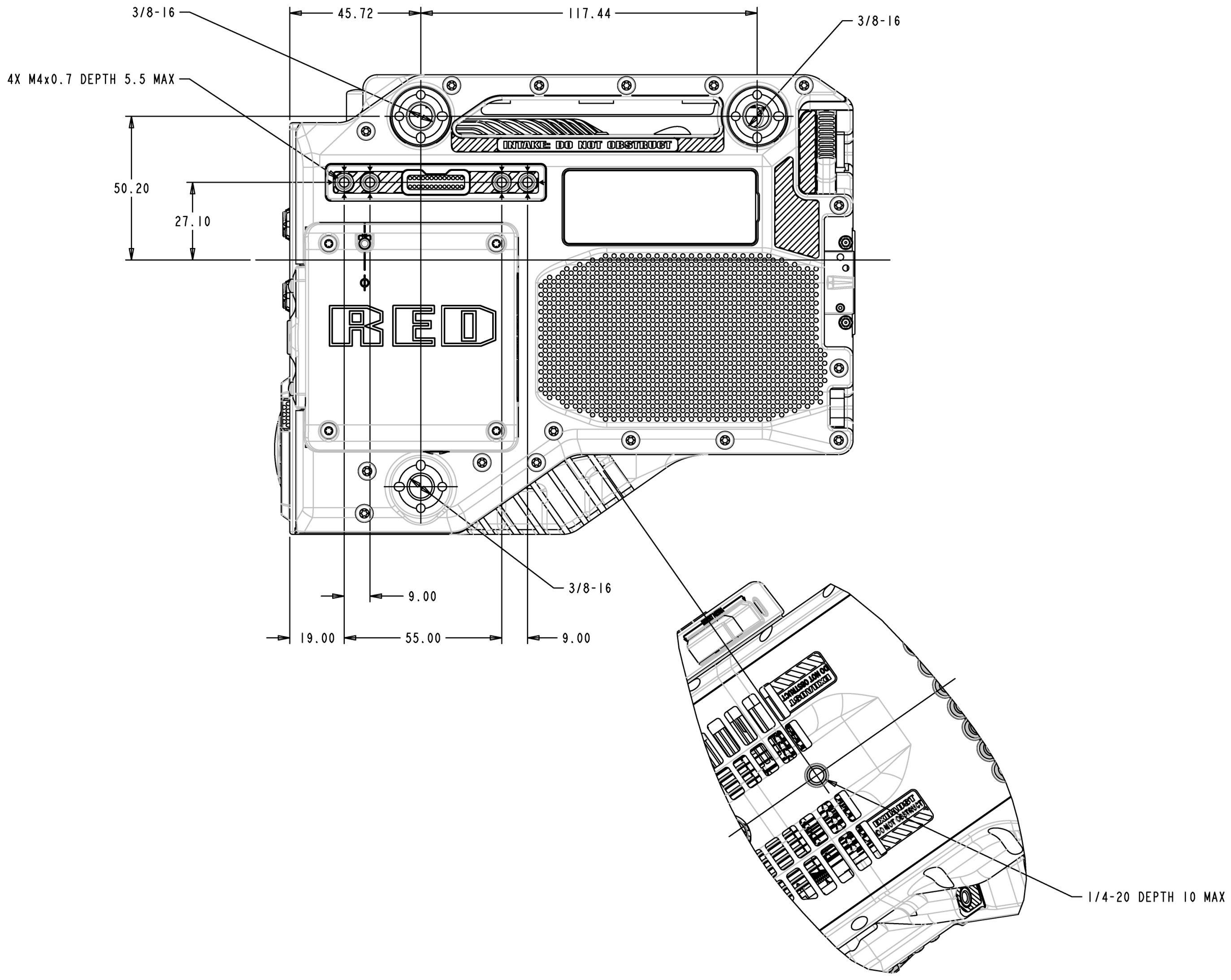
3/8-16
4X M4x0.7 DEPTH 5.5 MAX
45.72
117.44
3/8-16
INTAKE: DO NOT OBSTRUCT
50.20
27.10
RED
3/8-16
9.00
19.00
55.00
9.00
EXHAUST DO NOT OBSTRUCT
1/4-20 DEPTH 10 MAX

Figure: Camera Side View (Right)

SIDE VIEW (LEFT)

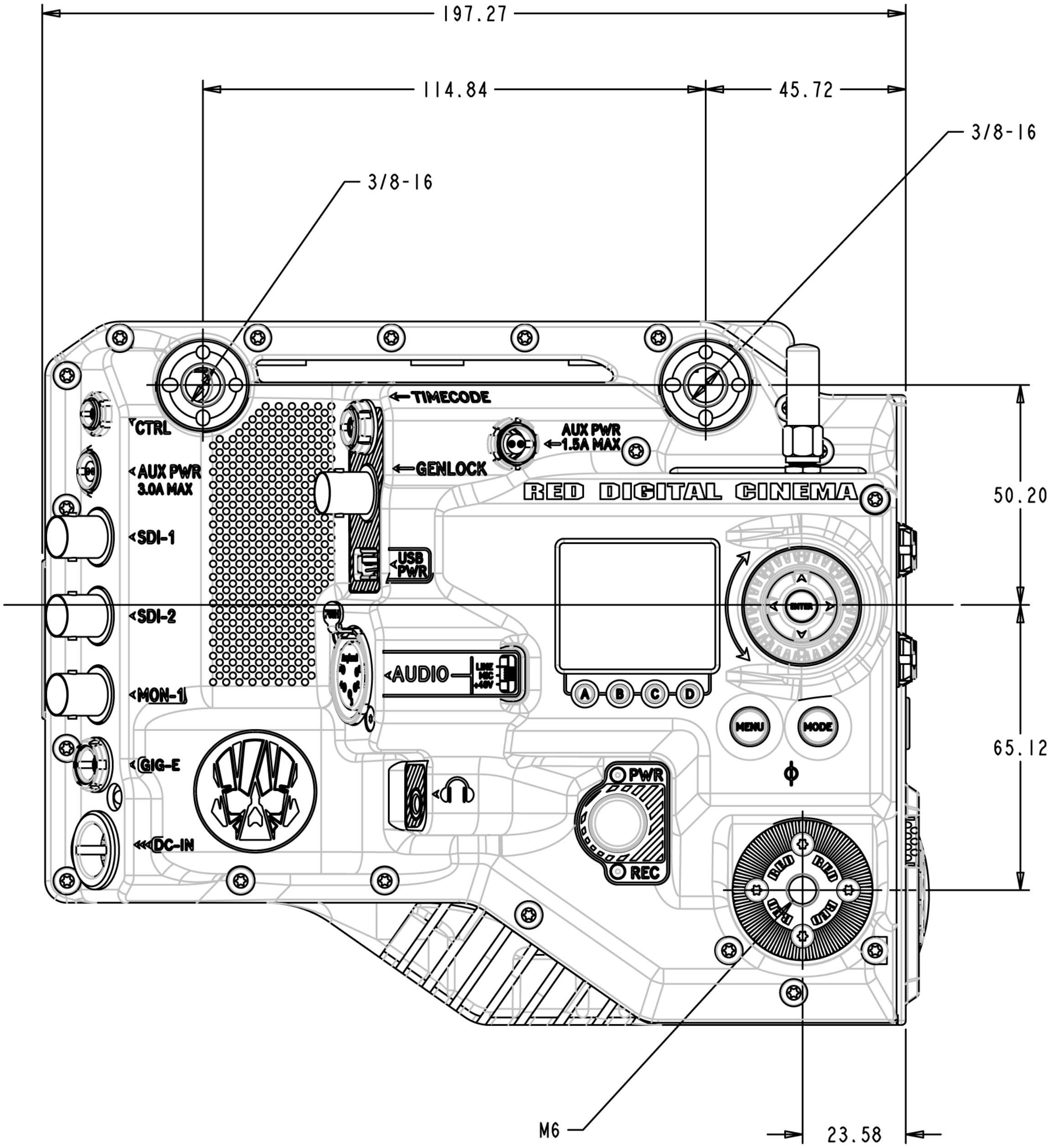
197.27
114.84
45.72
3/8-16
3/8-16
TIMECODE
CTRL
AUX PWR 1.5A MAX
GENLOCK
AUX PWR 3.0A MAX
RED DIGITAL CINEMA
50.20
SDI-1
USB PWR
SDI-2
AUDIO
MON-1
A
B
C
D
MENU
MODE
65.12
GIG-E
PWR
DC-IN
REC
M6
23.58

Figure: Camera Side View (Left)

TOP VIEW

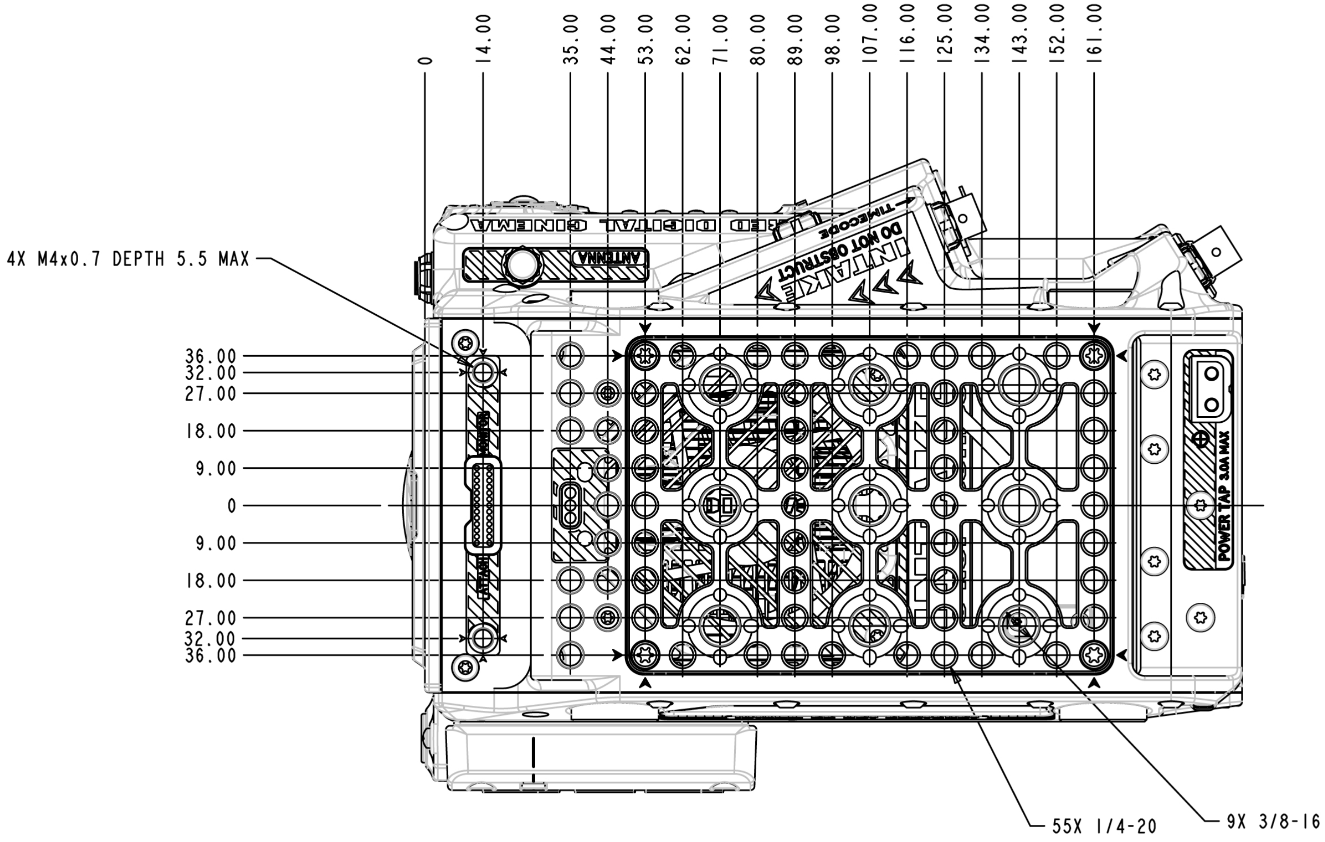
0
14.00
35.00
44.00
53.00
62.00
71.00
80.00
89.00
98.00
107.00
116.00
125.00
134.00
143.00
152.00
161.00
4X M4x0.7 DEPTH 5.5 MAX
36.00
32.00
27.00
18.00
9.00
0
9.00
18.00
27.00
32.00
36.00
RED DIGITAL CINEMA
ANTENNA
TIMECODE
DO NOT OBSTRUCT
INTAKE
POWER TAP 3.0A MAX
55X 1/4-20
9X 3/8-16

Figure: Camera Top View

BOTTOM VIEW

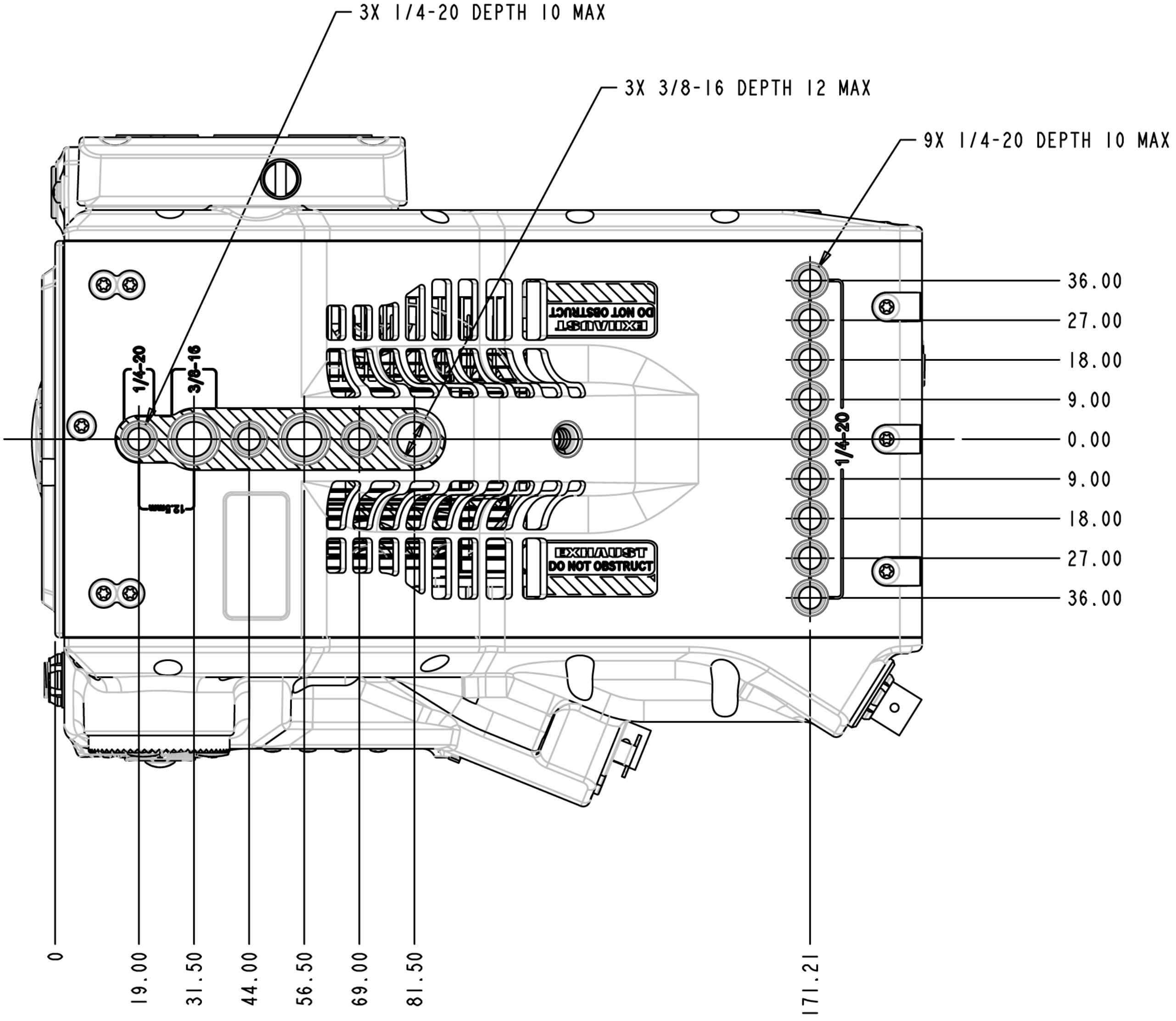
3X 1/4-20 DEPTH 10 MAX
3X 3/8-16 DEPTH 12 MAX
9X 1/4-20 DEPTH 10 MAX
1/4-20
3/8-16
12.5mm
EXHAUST
DO NOT OBSTRUCT
EXHAUST
DO NOT OBSTRUCT
1/4-20
36.00
27.00
18.00
9.00
0.00
9.00
18.00
27.00
36.00
0
19.00
31.50
44.00
56.50
69.00
81.50
171.21

Figure: Camera Bottom View

APPENDIX C:

LENS MOUNTS AND LENSES

(missing or bad snippet)

LENS MOUNTS

This section describes camera lens mounts. Camera mounts may be configured with 19mm rods to accommodate most cinematography lenses, matte boxes, and follow focus systems.

RED recommends only using the RED RANGER Shimmed PL Mount with the RED RANGER. Other RED lens mounts are mechanically compatible, but may cause focus accuracy issues.

WARNING: All lenses are hot swappable. However, lens mounts are NOT HOT SWAPPABLE, meaning you cannot remove or install lens mounts while the camera is turned on. Before installing or removing lens mounts, you MUST turn off the camera. Failure to do so may result in damage to the lens mounts or camera that is not covered under warranty.

REMOVE A LENS MOUNT

NOTE: You can change lens mounts in the field. However, RED® recommends that you change lens mounts only in a dust-free environment.

REQUIRED TOOL(S): T20 TORX® driver

1. Turn off the camera.
2. Attach the camera to a stable platform or position the camera on a clean and level work surface so that the lens mount screws are accessible.
3. Remove the lens and any devices, cables, or other accessories that might interfere with removing the lens mount.
4. Depending on the lens mount, you may need to turn the locking ring slightly counter-clockwise so that you can access the lens mount screws.
5. Loosen and remove the four (4) M4x0.7 x 8 mm lens mount screws in a cross pattern (“X” pattern) using a T20 TORX driver.

   NOTE: Some lens mounts have captive screws that are not removable.

   NOTE: Screw removal may require a large handle T20 TORX driver and additional leverage.
6. Remove the lens mount from the camera.

INSTALL A LENS MOUNT

NOTE: You can change lens mounts in the field. However, RED recommends that you change lens mounts only in a dust-free environment.

REQUIRED TOOL(S): T20 TORX driver

1. Ensure that the camera is turned off and remove any accessories or cables that may interfere with installation.
2. Inspect the gold electrical contact pins on the front of the camera and the gold contact pads on the rear of the lens mount to ensure that they are free of any contamination.
3. Align the lens mount on the front of the camera. The camera connection pins must align with the lens mount pins.
4. Depending on the lens, you may need to turn the locking ring slightly counter-clockwise so that you can access the lens mount screws.
5. Replace and loosely tighten the four (4) M4x0.7 x 8 mm lens mount screws in a cross pattern (“X” pattern) using a T20 TORX driver.

   WARNING: DO NOT FULLY TIGHTEN.

   NOTE: Some lens mounts have captive screws that are not removable.
6. Tighten the four (4) lens mount screws evenly in a cross pattern (“X” pattern) using a T20 TORX driver. DO NOT exceed 350 in-oz, or damage may occur.

   WARNING: DO NOT OVERTIGHTEN.
7. After installation, a hardware rediscover or firmware upgrade may be required. To perform a hardware rediscover, go to **Menu** > **Settings** > **Maintenance** > **Rediscover**. A system reboot is required after a hardware rediscover.

   NOTE: If you need to replace any screws, submit a Support ticket at https://support.red.com.

LENSES

This section describes lenses that are compatible with the RED RANGER Shimmed PL Mount. Other lenses and lens mounts may be used with the RED RANGER, but may cause focus accuracy issues.

To avoid vignetting, use standard full frame PL mount lenses.

NOTE: Lenses are hot swappable.

LENS WEIGHT AND LENS SUPPORT

Use a lens support system when mounting heavy or long lenses to your camera.

When mounting a heavy or long lens, ensure that the full weight of the lens is never directly on the camera or lens mount. Mount the lens to the support system first, and then carefully mount the lens to the camera.

WARNING: Failure to use lens supports appropriate for the lens and camera setup may lead to damage of the camera and lens mount. Any damage caused by not using a lens support system is not covered under warranty.

POSITIVE LOCK (PL) LENSES

This section describes the appropriate method for attaching and detaching PL lenses. For more information, refer to the original manufacturer's instructions. This section also lists lenses supported by the camera PL mounts.

WARNING: ALWAYS protect your equipment, when it is not in use, by replacing lens caps and mount caps.

ATTACH PL LENSES

1. Rotate the locking ring counter-clockwise to release the camera mount cap.
2. Remove the rear lens cap and the camera mount cap.
3. Align the key and contact pads (if present) on the PL lens with the key and connector pins on the camera PL mount.
4. Insert the lens into the camera PL mount.
5. Rotate the locking ring clockwise to secure the lens in place.

DETACH PL LENSES

1. Rotate the locking ring counter-clockwise to release the PL lens.
2. Remove the PL lens from the camera PL mount.
3. Replace the rear lens cap and camera mount cap when the lens is not in use.

CAMERA PL MOUNT SUPPORTED LENSES

The RED PL lens mount is compatible with most standard PL mount cinema lenses and devices.

WARNING: Using a non-standard PL mount lens or device with a camera PL mount may damage the camera and lens mount. Any damage caused by not using a standard PL mount lens or device is not covered under warranty.

FUJINON T2.9 CABRIO PREMIER PL LENSES

NOTE: The VTR switch on the lens is mapped to Record: Toggle by default. The VTR switch can be mapped to another key.

NOTE: Fujinon lenses running older versions of lens firmware might not send correct data to the camera.

The following Fujinon® T2.9 Cabrio Premier PL lenses are compatible with all camera PL mounts, but must be powered externally and configured a specific way:

- Fujinon 14-35mm T2.9 Cabrio Premier PL
- Fujinon 19-90mm T2.9 Cabrio Premier PL

To set up the Fujinon T2.9 Cabrio Premier PL lenses, follow the instructions below. Refer to the manufacturer's operation manual for detailed information about setting up and using the lens.

1. Attach the lens to the camera PL mount.
2. Ensure that the lens has lens firmware v6.4 or later (to check version in the camera, go to **Menu** > **Settings** > **Setup** > **Lens** > **Lens Info**). Contact the manufacturer for lens firmware.
3. On the lens, set the **Camera Communication** switch to **On**.
4. On the lens, set the **LDS, /i Select** switch to **Off**.
5. Connect an external power source to the lens.
6. In the camera, to **Menu** > **Settings** > **Setup** > **Lens**.
7. Deselect the **Enable Power to Lens** check box.

   NOTE: This option is only available when a camera PL mount is attached to the camera.
8. The lens should be successfully connected. However, if lens data does not display within 10 seconds, go to **Menu** > **Settings** > **Setup** > **Lens** and select **Detect Lens**.

CANON PL MOUNT LENSES

The following Canon PL mount lenses are compatible with all camera PL mounts, but must be configured a specific way:

- Canon CN7x17 KAS S Cine-Servo 17-120mm T2.95
- Canon CN20x50 IAS H Cine-Servo 50-1000mm

Requirements for using these Canon PL mount lenses:

- The lens requires lens firmware v6.4 or later; contact the manufacturer for lens firmware.
- In the camera, go to **Menu** > **Settings** > **Setup** > **Lens**, and select the **Enable Power to Lens** check box.
- RED recommends using an external battery for the lens, since the lens mount provides a limited supply of power to the lens.